May 1957

# Hetal Products Manufacturing

THE LAND

including finish

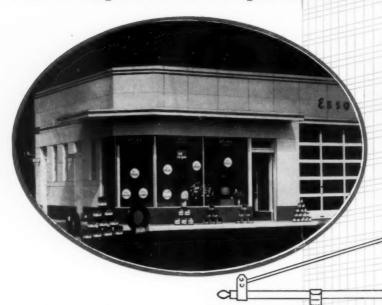
SERVING THE Philance AND

FARRICATED METAL PRODUCTS INDUSTRY

FROM RAW METAL TO FINISHED PRODUCT

## It's Ceramic"

for dependable porcelain enamel colors



for SKYSCRAPERS SERVICE STATIONS SIGNS

Since the time when signs were practically the only outdoor application of Porcelain Enamel, "Ceramic" has supplied colors for leading sign manufacturers. Oil companies were the first to realize that the attention-getting brilliance, the self-cleaning surface, and the lasting freshness of Porcelain Enamel made it also an ideal material for service stations, and "Ceramic" has long been depended on as a reliable producer of colors for them. Now, since Porcelain Enamel has come into its own as a versatile medium for striking architectural effects, "Ceramic" is even more widely known as a supplier of colors that meet the exacting demands for constant uniformity and reliable workability.

ESSO



CERAMIC COLOR & CHEMICAL MFG. CO.

NEW BRIGHTON, PENNSYLVANIA

## WHY TIGHT ENAMEL-TO-METAL BOND

IS ASSURED WITH

ARMCO Enameling Iron



Tiny projections on the surface of Armco Enameling Iron (below) are only about .000125-inch high. Although you can't even feel them on the surface of the sheet, they hold the finish tightly.

Here's the reason why Armco Enameling Iron provides a uniformly high quality base metal for porcelain enameling:

Little projections—tiny metal "fingers" that are readily formed in the firing process on the surface of Armco Enameling Iron—take and hold the porcelain enamel finish in a tight grip.

But that's not all. In addition to lifetime bond, Armco Enameling Iron offers all these other important advantages.

- ... No sag at firing temperatures of established high quality frits.
- ... A special surface designed to help drain enamel evenly.

... Smudge-free surface that cuts pre-cleaning time.

## Here's Why It's No. 1

Unlike many metals used for porcelain enameling, Armco Enameling Iron is made only for porcelain enameling. Every step of its production—from open hearth to final inspection—is closely controlled to make it the highest quality enameling sheet you can use.

Our catalog, "Armco Enameling Iron," tells the full story about this superior base for porcelain enamel finishes. Write us for a copy.

## ARMCO STEEL CORPORATION

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SHEFFIELD STEEL DIVISION . ARMCO DRAINAGE & METAL PRODUCTS, INC. . THE ARMCO INTERNATIONAL CORPORATION



as the SIZZLE sells the steak

DAZZLE of Chromium sells the stove

LET

SHOW YOU THE PRACTICAL WAY TO ADD THE SALES-MAGIC OF CHROMIUM TO ANY APPLIANCE

There's magic customer appeal in the gleaming beauty of chromium. Accessories, ornaments and functional parts finished in mirror-like chrome catch the eye, strike the fancy and win the choice of shoppers.

But what about cost in such up-grading of merchandise? You know piece-plating would price it out of competition. Well, here's where APOLLO ChromSteel-prefinished in sheetsallows an economical approach. APOLLO's large-scale, precision finishing costs demonstrably less than piece-plating.

That's why stove manufacturers are putting more and more APOLLO ChromSteel on the payroll. Adding desirable dazzle to their products they (1) sell more units and (2) realize larger dollar sales per unit. Illustrations to the right show what they are doing:

APOLLO Prefinished Steel-CHROMIUM, NICKEL, BRASS and COPPER Finished . . . polished or satin . plane, striped or dimensional patterns-serves as effective, functional sales features on countless appliances.

Ask about APOLLO's Product Design Service. Professional sketches economically adapting APOLLO improvements to present or planned products are available to you without obligation.







for this purpose.

TOASTERS



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Top, bottom, sides, end and door of glistening, easy-toclean chromium adds aristocratic touch to the built-in rotisserie on a number of popularly priced gas and electrical ranges.



## APOLLO ChromSteel Broiler Grill

The efficiency of chromium for grills has been long established. But its present day use as a clincher to sell stoves—at insignificant outlay per unit - has become increasingly popular and successful.



APOLLO ChromSteel Individualized Control Panels



uniquely striped and dimensionally patterned

Chrome, Copper or Brass finished steel specially

May · 1957 VOL. 14 · NO. 5



(including finish)

MONTHLY TRADE PUBLICATION

Established January 1944
Published by

DANA CHASE PUBLICATIONS

York Street at Park Avenue, Elmhurst, Illinois Telephones • TErrace 4-5280 • TErrace 4-5281





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CLASSIFIED ADVERTISING .....

## METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information in plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, abbacription price is \$8.00 per year, domestic. To all other countries \$10.00 per year (U.S. funds). Single copies, \$1.00.

Editor and publisher • DANA CHASE

Associate Editor • WM. N. LARSEN

Western Editor • GILBERT C. CLOSE

Publisher's Assistant • DOROTHY ROSE
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## for instance

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## DETROIT STAMPING COMPANY

Established 1915

404 Midland Ave., Detroit 3, Mich.

"America's Leading Job Stamping Manufacturer"





## magnetized control boards

Gentlemen: In the February, 1957 issue of the METAL PRODUCTS MANUFACTURING magazine there is a small comprehensive write-up on the use of magnetized control boards for visual control systems. Could you possibly advise where these boards may be obtained? Thanking you for your cooperation in this matter, we are.

H. J. Fairman, Purchasing Agent John Wood Company Limited 1550 Dublin Avenue

Winnipeg 3, Manitoba, Canada Ed. Note: The magnetized control boards are the product of Methods Research Corp., 471 Mosel Ave., Staten Island 4, N. Y.

## vibrating screen separator

Gentlemen: Would you please send me the information offered in your February issue on Page 14-15 concerning the vibrating screen separator. Thank you.

E. Wallin
Production Engineering Dept
Telecommunication Division
Stromberg-Carlson Company
Rochester 3. New York

Stromberg-Carlson Company
Rochester 3, New York
Ed. Note: Information on the vibrating screen
separator can be obtained from the Cleveland
Vibrator Co., Dept. MPM, 2828 Clinton Ave.,
Cleveland 13, Ohio.

## jet engine engineering

Gentlemen: I have just finished reading the February issue of your fine magazine, and notice that subscriptions are available to engineers in metal product manufacturing plants. We at AGT are involved primarily in the design and production of aircraft jet engines. I would appreciate being placed on distribution for METAL PRODUCTS MANUFACTURING for myself and for my associates in the Applied Mechanics group.

John B. Wood General Electric Company Aircraft Gas Turbine Division Jet Engine Department Component Engineering Section Cincinnati 15, Ohio

## additional copy needed

Gentlemen: If possible, an additional copy of your publication METAL PRODUCTS MANUFACTURING should be directed to our paint department supervisor, Mr. Percy Baker. Please accept our compliments on this excellent periodical, very suitable for our industries.

W. J. Mosley, P.Eng. Chief Engineer The Easy Washing Machine Co., Ltd. Toronto 10, Canada

Gentlemen: I find that METAL PRODUCTS MANUFACTURING magazine is an invaluable aid in my work, which consists of developing processes for the finishing of aluminum and taking these same

processes through the pilot line stage. Therefore, I would appreciate very much being placed on the free circulation list of this magazine. Thank you.

Gerald L. Hager Applied Research Chemist Reynolds Metals Company Parts Division 2000 South Ninth Street Louisville 1, Kentucky

## organization for engineering

Gentlemen: We note that there is listed in the "examples of typical features" for 1956 an article in which our Mr. R. M. Cuddy is particularly interested. If it is at all possible we would like to obtain a copy of "Organization for engineering and manufacturing" by L. W. Evans, Vice President, Rheem Manufacturing Company. We would also request that you add the following names to your mailing list:

Mr. R. M. Cuddy, Chief Engineer Beatty Bros. Limited

and
Mr. J. W. Ramore, Supervisor
Appliance Design Division
Beatty Bros. Limited

Thanking you for your cooperation in these matters, we remain

Audrey Minaker Secretary to Chief Engineer Beatty Bros. Limited Fergus, Ontario, Canada

## finds MPM helpful

Gentlemen: Thank you for the tear sheets and the February issue of METAL PRODUCTS MANUFACTURING. This magazine is a new one to me. I'm enjoying it very much. Each issue has some material which is usable in my household equipment classes.

Clarice Bloom Household Equipment The Ohio State University Columbus 10, Ohio

## appreciates MPM

Gentlemen: The engineers in my section enjoy your magazine very much, as do I. Thank you very much.

C. R. Cornthwaite
Office, Chief of Ordnance
ORDTB-Materials
Department of the Army
Pentagon Building
Washington 25, D. C.

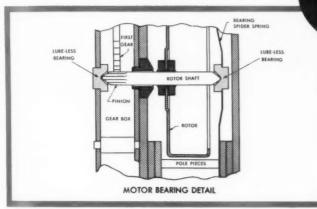
## wishes magazine for reference

Gentlemen: I have had, on numerous occasions, the privilege of reviewing your publication "Finish"; which has now been changed to "METAL PRODUCTS MANUFACTURING."

I have found that many of the articles were very interesting and of value for reference. I would like very much to be included on your mailing list to receive this magazine each month.

Gilbert L. McIntosh Supervisor of Planning and Methods A. O. Smith Corp. Permaglas — Heating Div. Kankakee, III.

# Prevent RANGE TIMER "GUM-UP" with amazing





## LUBE-LESS BEARING MOTOR

## HERE'S WHY RANGE TIMER "GUM-UP" AND RESULTANT TIMER FAILURE JUST CAN'T HAPPEN WITH THE NEW LUX LUBE-LESS MOTOR.

The Lux synchronous motor rotor bearings require NO LUBRICATION. Absence of lubricants prevents formation of gummy residues ... primary cause of failure in range timing motors required to operate in the presence of heat. Mechanism is completely enclosed in dustproof case.

Rounded ends of the rotor shaft ride in cup-shaped bearings, with a specially designed spider spring mount taking up end play. This exclusive Lux development assures constant torque output and continuous accurate positioning of the rotor pinion in relation to the first gear. In addition, wear-and-noise producing shaft vibration is completely eliminated.

First pinion is cut integrally with the rotor shaft, eliminating any possibility of pinion rattle. This design also makes possible a small pitch diameter which permits a low feet per minute speed and a slower speed of gear reduction unit.

Lux synchronous timing motors are engineered and constructed to perform reliably and accurately under the most severe operating conditions. Quietness is retained even through long and continuous runs. Stalling for indefinite periods is possible without injury.

Write for complete details of the Lux Lube-Less Bearing Motor. You'll marvel at performance data now available.

## THE LUX CLOCK MANUFACTURING CO., INC.

95 JOHNSON STREET . WATERBURY 20 . CONN.



10

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or to



For the best, most economical quality stampings and fabricated parts,

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Youngstown produces drawn stampings and fabricated parts for leading manufacturers of various products—providing quality parts and a dependable, economical source of supply.

First we analyze the part to be produced, design and build the required special tools, arrange the production line to produce parts efficiently that meet your exact specifications. That is why Youngstown Metal Products has been a preferred source of supply to many manufacturers for the past 25 years.

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METAL PRODUCTS COMPANY

Youngstown I, Ohio

## Meet the men behind the gun!



Wayne R. Fuller
DIRECTOR OF RESEARCH



## Creative alchemy shares with styling the challenges of customer demand

The competitive nature of our economy is more demanding today of originality and perfection. In product finishing, new styling ideas must be formulated, not only for eye appeal, but for long term performance and efficient application on a production basis. Under the experience direction of Wayne R. Fuller our laboratory staff is constantly at work creating new and better ways to satisfy the varied demands of our customers.



## GRAND RAPIDS VARNISH CORPORATION

GRAND RAPIDS VARNISH CORPORATION, Grand Rapids, Michigan
GRAND RAPIDS VARNISH CORPORATION OF NORTH CAROLINA, High Point, N. C.

Makers of the Famous Suardsman Finish and Suardsman Cleaning Polish.

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THE BETTER THE FINISH, THE BETTER THE BUY



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Patterson Mixers deliver years of satisfactory service under rugged operating conditions because each component is engineered specifically for the job. Drives, stirrers, tanks, linings and valves are integrated for your production requirements, plus the extra performance margin that lowers maintenance and increases operating life. Let us quote on your needs.

## The Patterson Foundry and Machine Company

A Subsidiary of Ferro Corporation East Liverpool, Ohio, U.S.A. The Patterson Foundry and Machine Company, (Canada) Limited

Toronto, Canada

## INDUSTRY MEETINGS

## AIR CONDITIONING & REFRIGERATION

Air Conditioning and Refrigeration Institute's Annual Meeting, The Homestead, Hot Springs, Va., May 5-8.

### CERAMIC SOCIETY

The American Ceramic Society's 59th Annual Meeting, Statler-Hilton hotel, Dallas, Texas, May 5-9, 1957.

## ARCHITECTURAL METAL

National Assn. of Architectural Metal Manufacturers' 19th Annual Convention, Fairmont hotel, San Francisco, Calif., May 7-12, 1957.

### PORCELAIN ENAMEL

The Porcelain Enamel Institute Midyear Divisional Meeting, Architectural, Sign, & General Enameling Divisions, Edgewater Beach Hotel, Chicago, May 9-10, 1957.

### PRESSED METAL

Pressed Metal Institute meeting, Brass Rail, 100 Park Avenue, New York City, May 16.

### **ELECTRICAL ENGINEERS**

American Institute of Electrical Engineers Appliance Technical Conference, Engineering Societies Bldg., Detroit, Mich., May 20-21.

## MECHANICAL ENGINEERS

American Society of Mechanical Engineers, and Design Engineering Show, Coliseum, New York City, May 20-23, 1957.

## MIDWEST ENAMELERS

Midwest Enamelers Club Maypole Party, White Pines Country Club, Bensenville, Ill., May 24, 1957.

## APPLIANCE MANUFACTURERS

Institute of Appliance Manufacturers 25th Anniversary Convention and Exhibit, The Netherland Hilton, Cincinnati, Ohio, June 3-5, 1957.

## PRESSED METAL INSTITUTE

Pressed Metal Institute National Sales Conference for Metal Stampers, Hotel Carter, Cleveland, Ohio, June 14, 1957.

## HOME FURNISHINGS

International Home Furnishings Market, The Merchandise Mart, Chicago, June 17-28.

## **BOX ASSOCIATION**

National Wooden Box Association annual summer meeting, Lake Placid Club, Essex County, N. Y., June 24-26.





## Aluminum is COLOR ... Alcoa® is aluminum

Aluminum can match the iridescent rainbow. of a peacock feather or the hard, jet black of onyx. The process is called anodizing and Alcoa can show you how. You can capture the deep, rich colors of porcelain enamel and fix them permanently to aluminum. You can paint, lacquer and enamel aluminum. You can brighten it electrically or chemically so it absorbs colors from its environment. Any metal that will electroplate can be firmly deposited on aluminum. Where is the limit of tints and hues and shades possible with aluminum? Only in the designer's mind, and Alcoa color research keeps his thinking. unconfined. Color is a dramatic reason why aluminum is the designer's metal, and Alcoa your source of the new and different.

Joseph porgraphy with ALCOA

## HERE'S A SOLID FOUNDATION FOR

In Alcoa's library are many publications prepared with but one objective: to help designers and fabricators learn the basic facts about aluminum. How to design with it. How to work it. How to join and fasten it. How to capitalize on its unique advantages to get better, longer lasting, lower cost products.

Among the newest are these . . .

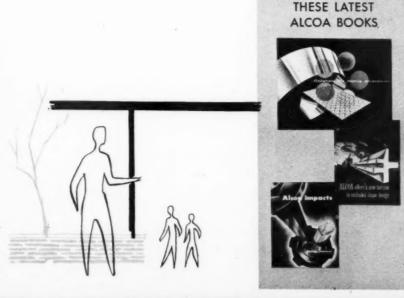
Finishes for Alcoa® Aluminum—a colorful, penetrating handbook prepared by the men who know the most about aluminum finishes. It includes all of the latest and most exciting finishes and tells how to achieve them.

A New Horizon in Extruded Shape Design—a thorough text designed to stimulate imaginative thinking about designing and applying extruded aluminum shapes.

Metal in Motion... Alcoa Impacts—the very latest facts on this fascinating way to produce complex shapes in aluminum with a single press stroke.

In addition to these newest Alcoa publications, the Alcoa library has hundreds of others, plus dozens of motion pictures. Most of these are described in a 41-page index called *Alcoa Informational Aids*. All of these films and publications are available from Alcoa for your use.

Order this index and these newest publications right now. Send your name, address and company affiliation to Aluminum Company of America, 2194 Alcoa Building, Pittsburgh 19, Pennsylvania.









## **Enough DIVOBOND to phosphatize 1,000 sq. ft. of work**

## low cost, scale-free phosphatizing

One-half pound of Divobond in solution covers 1,000 sq. ft. of work with a dense, tight, uniform iron phosphate coating. Using less compound to initiate a better finish automatically lowers production costs.

Another cost-cutting Divobond feature is its remarkable scale prevention action. Even in hard water areas, plants report a year or more of continuous operation without a sign of scale. Buildup is eliminated and nozzles are free to spray on even, uniform coatings, thus eliminating appreciable maintenance costs. This scale prevention also lowers heating costs

by keeping coils free of insulating blankets of scale.

Divobond is easy to control. Its non-critical pH permits operation through a wide range. A simple titration shows solution concentration.

Divobond may be used in washers with mild steel equipment. Reduced capital equipment requirements and economical surface preparation possible with Divobond suggests consideration in your plant.

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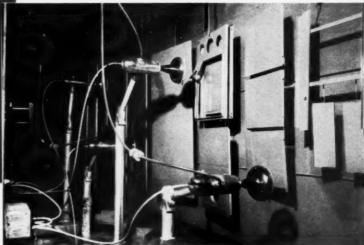
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## Times as many Furnace Casings per gallon of paint with RANSBURG NO. 2 PROCESS!



This Lo Boy model, Series 6000, is typical of the Waterman-Waterbury line of winter air conditioners now painted electrostatically.



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Results exceeded expectations when Waterman-Waterbury, Minneapolis, modernized their finishing department and went from hand spray to Ransburg No. 2 Process in painting their quality line of heating and air conditioning equipment.

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## Electro-Coating Corp.

Barth and Sanders, Indianapolis 7, Indiana



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Gay Kalb, Glaze and Materials Foreman, Robinson Brick & Tile Co., inspects the 54" x 54" mill lined with Coors High Density Lifter Bar Lining.

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Tongue support part for New Holland baler, prepared with 75-ton Warco inclinable punch press, is shown fitted in place on Hayliner 68 assembly line at New Holland, Pa. Inspecting the job is Sub-assembly Foreman Lee. Larkin.

"Not a breakdown in five years," says leading farm machine manufacturer

• Several years ago New Holland Machine Company, New Holland, Pa., purchased their first Warco Press ... an inclinable punch press. It is still working as good as the day they bought it. Since then they have added other Warcos for piercing, blanking and forming a variety of machine parts. "We find these presses very satisfactory," say New Holland officials; "in our five years of using Warcos we have never had a breakdown."

Warco Presses stand up because they are built from the frame out to deliver maximum performance in the most difficult assignments.

THE FINISHED PRODUCT... Warco inclinable punch press had a hand in turning out this smart-looking, smooth-performing Hayliner 86-baler. The machine was designed to bring the average-size farm big baling capacity at smaller baler cost.



Using a 75-ton Warco inclinable punch press, operator Christian Good turns out tongue support parts. Watching the operation is Assistant Foreman Lester Howe. Tengauge hot-rolled sheet steel is used for the part.

The Federal Machine and Welder Company

Federal

WARREN, OHIO

## **Fabricating room air conditioners**

Westinghouse East Springfield appliance plant produces room conditioners at rate of one every forty-five seconds

WESTINGHOUSE "Streamliner" room air conditioners for window or in-the-wall installation are coming off the conveyorized assembly line in the East Springfield, Mass., plant of the electric appliance division at the rate of one every 45 seconds. The conventional window-type room air conditioner can be produced on this same assembly line at the same rate.

The completion of the air conditioner assembly line and the accompanying tooling for the cabinet and compressor completes a multimillion-dollar rearrangement and modernization program that was started nearly three years ago.

This program not only provided a more efficient operation, but also provided for increased production capacity for all products within the same general floor space as well as for the production of the room air conditioners — a new product to East Springfield. New tools and thousands of feet of conveyor were included in the new layout.

This article includes highlights of the fabrication operations for the production of room air conditioner components

## Quality control procedures

All incoming steel is inspected for alloy content, size, tensile strength, hardness, and surface conditions before it is used. During shearing, stamping, forming, punching, and drilling operations — inspections for size, depth of emboss, width and squareness of flanges, size and location of various holes, absence of die marks, burrs, dinges, and scratches are made on a first piece plus periodic patrol piece inspection basis.

The same inspection pattern is followed for welding and sub-assembly operations. Dimensional tolerance checks are made after every manufacturing and fabrication operation to insure proper fit.

The starting point for all air conditioners at East Springfield is the steel storage, shear, and press area. At this point, sheet steel for the cabinet; the assembly base for the compressor, condenser, and evaporator; the many small parts; and electrical sheet steel for the compressor motor are received, inspected, and released to manufacturing operations.

From this point on in the manufacturing cycle, machines do everything: stamp out compressor motor laminations; coat structural sheet with a drawing compound; shear sheets to size; draw, form, trim, and notch structural sheet into hundreds of small intricate parts; blank sides, top, and base of the cabinet which are then joined together by welding.

## **Cabinet fabrication**

One of the more interesting fabrication operations is that of forming the cabinet for the air conditioner. This starts out as a single, flat sheet of steel that is sheared to size; notched and pierced; flange rolled, and then shaped

The bottom of a cabinet for the Westinghouse Streamliner room air conditioner is being positioned in this combination tangent bender and multiple spot welder prior to joining it to the side and top wrapper. The wrapper has been sheared to size, notched, pierced, and flange-rolled prior to forming in the tangent bender.





This is an in-between step in the manufacture of the condenser and evaporator — expanding the copper tubes that eventually become part of the refrigerant circuit. This operation insures an intimate contact with the aluminum radiating fins.

Unloading sheet steel at Westinghouse's East Springfield appliance plant. Sheet steel is used for the air conditioner cabinet; the assembly base for the compressor, condenser and evaporator; and small parts — supports, brackets, gussets, and similar parts for strengthening the cabinet. Electrical sheet steel for the compressor motor is also received here.



in a combination tangent bender and welder to form the wrapper — the three sides of the cabinet. The base, which has been previously sheared to size and formed, is placed in the tangent bender and welder and is joined to the wrapper during the welding cycle. This completes the cabinet fabrication.

The assembly base for the compressor, condenser, and evaporator is also formed from a flat sheet of steel. After shearing to size; piercing and forming; it is placed in an automatic welder where 15 parts (studs, brackets, T-nuts) are joined to it in one shot.

## Condenser evaporator

The condenser and evaporator are both made of a number of copper tubes bent in the shape of a hairpin and then inserted in aluminum radiating fins. The copper tubes are bent on a special tube bender while the aluminum fins are pierced, embossed, cut to length, and stacked on a special press. Aluminum in coils is the source of raw supply for these presses. Following insertion in the radiating fins, the copper tubes are expanded to insure a tight fit. Return bends and connecting tubes are attached and then automatically brazed.

Each finished condenser and evaporator is given a leak test at 300 lb. pressure by immersion in water. Units that pass this test are placed on a storage conveyor. Later they are dehydrated for one-half hour at 275°F and then purged with dry air. The condenser is then ready for the assembly line. The heat exchanger must be brazed to the evaporator. Then it is ready for the assembly line.

## Compressor-motor housing

The compressor is interesting from a manufacturing point of view. As used here, compressor means motor and compressor, as both are hermetically sealed in the same shell.

The motor rotor and stator laminations are automatically stamped from special electrical steel and annealed. All rotor laminations are passed through a pusher-type furnace to further improve the electrical qualities of the steel. The stators are annealed in separate furnaces.

Annealed rotor punchings are manually placed on fixtures and are automatically skewed. The fixture and the skewed punchings are manually placed on the bed of an automatic aluminum casting machine. From this instant, the machine takes over. The fixture is moved to position over the casting well;

molten aluminum is automatically ladled into the well; fixture and punchings are submerged into well, forcing molten aluminum through rotor slots; after enough time has elapsed to permit metal to chill, fixture is removed and placed on gravity conveyor; fixture and rotor roll into automatic fixture-tripping device; fixture is stripped from rotor and returned to original position; rotor rolls into gravity conveyor that carries it to cooling tower.

The cooled rotor rolls by gravity conveyor from the cooling tower to a superfinish hone where it is automatically loaded into a gaging and sorting fixture. The shaft bore is then honed automatically, and gaged in the fixture. It is then ejected onto another gravity conveyor. This conveyor carries the rotor to a special lathe where an automatic loading device places the rotor on an expanding arbor in the shaft bore. The arbor is then expanded and in position for outside diameter turning in the lathe. Precise dimensional tolerances are maintained through feedback control from a proximity gage using a magnetic field as the sensing element.

One interesting detail about this lathe: the tool is circular in shape. This makes it possible to index it some 200 times and notch forward 11 times for each indexed position. The result is a tool with some 2500 cutting edges. All indexing and notching is controlled automatically through the proximity gage control.

The rotor is post annealed in a conveyorized oven to relieve strains set up during machining and to break the aluminum in the rotor slots away from the electrical steel. From the time the rotor enters the die-cast machine it is never again touched during manufacturing operations.

Other component operations include those on stator punchings, pole coils and starting windings.

## Compressor housing fabrication

Aluminum die castings are used for the compressor housing, piston, connecting rod, outboard bearing, and cylinder. Reasons for the switch from cast iron to aluminum were reported as: lower capital investment in tools, lower unit cost per piece, simplified fabrication procedures, and more uniform quality castings.

Four automatic die-casting machines, each equipped with an automatic-ladling, electric melting-furnace, are used.

to Page 82 ->



The refrigerant circuit of a standard window room air conditioner is being charged with Freon refrigerant and oil by automatic equipment. The operator in the dark glasses is sealing the system by brazing the end of the charging tubes. The system is then given an electronic leak test in the air-conditioned booth in the background.

Wiring electrical connections for a Streamliner room air conditioner. Note shallow depth from condenser face to evaporator face.



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USS VITRENAMEL—so carefully produced from the open hearth furnace to the finished sheet—is an ideal enameling base. USS VITRENAMEL makes a permanent bond with the porcelain enamel, which, when applied to USS VITRENAMEL, is highly resistant to chipping, cracking and other types of failure. USS VITRENAMEL will be available in coils.

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## Producing nylon enclosed steel stampings at 750 per hour

one key lever insert is placed in each of twelve recesses of a mold that produces 24 moldings in each one-minute cycle—these combination steel-plastic components promote long life and quiet operation.

by Charles J. Sammons . PROJECT MANAGER - MACHINING, ELECTRIC TYPEWRITER DIVISION, INTERNATIONAL BUSINESS MACHINES CORPORATION, KINGSTON, N. Y.

M<sub>P</sub>M

IT IS NOT UNCOMMON to find industrial applications of plastic moldings in which metal inserts are embedded, but it is decidedly uncommon

to find a steel stamping in and around which two plastic sections are molded. Such a part, termed a "cam lever," is produced, however, on a large scale by the Kingston, N. Y. plant of International Business Machines Corporation, and many of these cam levers are assembled into each of the IBM electric typewriters produced in this plant.

As Fig. 1 indicates, this lever has a contour somewhat resembling that of a sea horse. Included as parts of the lever are two nylon moldings that cover portions of both sides of both ends, and that also pass through holes pierced in the stamping. This stamping is blanked from flat steel 0.040 in. thick, but has at one point a small V-shaped projection formed by a punch that stretches the metal as it pierces one hole. The stamping is half hard and is given a hard case 0.003 in. thick.

At one end, the molded portion forms a cam 5/32 in. thick. Its contour is given fine tooth-like serrations over a

length of about 7/8 in. In using the typewriter, this serrated cam contour is brought into contact with a constantly rotating rubber roll that causes the lever to swing about a shaft that passes through a hole not far from the center of the lever. In making this motion, the corresponding type bar is actuated, always with the same force, so that uniform impressions are made without regard to the varying finger pressure applied to the type keys.

Formerly the cam was all steel, but machining, including the serration cuts, was expensive, some dimensions were hard to hold, wear occurred between

Fig. 1 (below) — Cam for an IBM electric typewriter. A nylon injection molding that is held within close dimensions is formed around each end of the steel stamping, previously case hardened and used as an inset in the mold.



Fig. 2 (right) — Removing a "gate" of 12 cams from the mold in a press. Each lever includes two separate moldings, each connected to a runner that is fed via a sprue channel receiving liquid plastics from an injection nozzle.



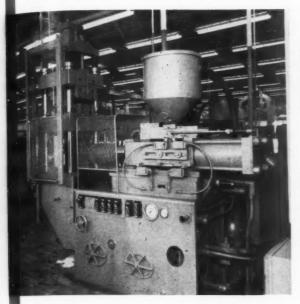


Fig. 4 (left) — Injection molding press, showing the injection cylinder below the hopper that feeds granular nylon plastic to the cylinder, whose ram forces the plastic through a heating chamber.

Fig. 3 (below) — Part of a molding press whose mold is shown open. Under the central screen is the heating chamber for the plastic. The operator has just removed a "gate" of parts that he breaks from runners after the mold is closed again for refilling.

serrations and the roll and the noise produced was excessive. These considerations led to the use of nylon components because they reduce wear, have long life, are easily produced at a high rate and at low cost, require no machining, and promote silence in operation.

Both moldings pass through holes pierced in the stamping, locking the moldings positively to the stamping, and the one at the hooked end passes through a hole and is molded around a pin of the mold, producing a closely sized and precisely located hole around which the nylon forms a bushing on which the wear in service is negligible. These advantages are important on several scores, and the rapidity and simplicity of production are especially noteworthy, as is the uniformity attained. Dimensional stability of the plastic portions is excellent.

Production of the moldings around the steel insert is done in a vertical press using a 12-cavity mold that is filled by a horizontal injection unit. Parts of the mold and toggle locking press appear in Fig. 2, the die being open and the operator shown holding a "gate" of 12 cam levers. These are still connected to the sprue and runners that lead from the point of injection to the 24 moldings, of which there are two per lever produced.

To start a press cycle the operator closes a transparent sliding door and presses the button that automatically closes the mold and starts the molding cycle. Before so doing, however, he places a steel insert in each of the 12 recesses in which they are positively positioned. All the remaining portions

of the cycle, save removing of the gate moldings, take place automatically.

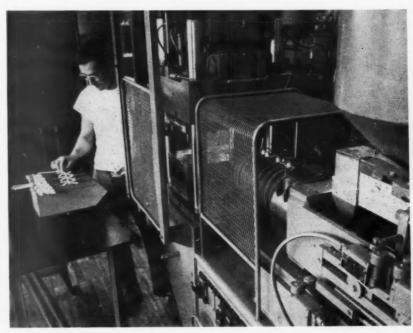
After the mold is closed and locked, the horizontal plunger advances and fills the die with the plastic, which has been heated to injection temperature and is in a viscous fluid condition. 800 to 1,000 psi injection pressure is used. After a timed interval, the injection ram returns, the mold opens and the door is raised automatically. Then the operator removes the "gate" of moldings. This leaves the mold ready to receive another set of inserts for the next cycle.

While the new molding cycle proceeds, the operator has time to inspect

the moldings already removed, to break them from runners (Fig. 3), and to drop them into a tote pan. He places the runner and sprue in another box and they are later ground and mixed with new granules (2 parts of old to one of new) before this mixture is reheated in the injection unit, which is fed from the hopper.

Plastic employed is known as zytel nylon, type 101, and is white in color. Successful molding depends largely upon having the plastic injected at the right temperature at specific points. Each time the injection plunger retracts, an amount of granules sufficient for one mold filling falls from the hopper into the injection cylinder. Each charge is forced into the rear end of the heating chamber and is brought to specified temperature and viscous liquid condition before being forced through the injection nozzle, which also is heated. Heat is supplied by electric resistance units around the cylinder and nozzle jackets. Four thermostats control the jacket temperature and through it the temperature of the plastic, which is held at 530° F in the heating zone, and 510° F in the nozzle.

About 750 cam levers are produced per hour, or 6,000 per 8-hr. shift, the cycle time being slightly less than one minute. Parts broken from runners are ready for use after a short tumbling operation that removes fine flash and sharp edges. Cost per lever is much below that formerly attained, yet the quality is much better, and service life is greatly increased.





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## a leading designer speaks his piece on . . .

## Confusion in the marketplace

by Gordon J. Lippincott . LIPPINCOTT, & MARGULIES, INC., NEW YORK



Here is a picture of three nationally advertised, thoroughly promoted brands of home washing machines (Picture #1). If you can identify even one of them

correctly, you're doing well. In fact, you're doing considerably better than 187 people who tried a similar test recently at a New York discount house.

In this case, the store even offered a prize to anyone who could correctly identify just *one-third* of the appliances in a special display. Out of 187 customers who tried, not one walked off with the prize.

This revealing story points up the problem facing many manufacturers today. In spite of staggering expenditures for national advertising, the average consumer still can't tell one brand from another at the point of sale.

The problem is bad enough in the "jungle" of appliance stores where the major white goods are lined up, row on row. But the confusion in the market-place really becomes acute when the customer moves on to the section of the store where smaller appliances, such as table radios, are displayed (Picture #2).

The fact that the consumer becomes confused by the bewildering array of undifferentiated washers, dryers, radios, TV sets, mixers, toasters and the like when he reaches the point of sale does not mean that advertising for these products has somehow failed to do its job. Quite the contrary. Advertising can — and does — generate the need and stimulate the desire to buy a particular product. Frequently it even sells the customer in her home on a particular brand. The point is, if the customer cannot recognize the brand when she gets to the store, purse-in-hand, then

the effectiveness of the whole expensive pre-selling job done by national advertising is automatically cancelled. In fact, advertising dollars spent by, say, General Electric may actually wind up selling a Hotpoint product.

## The role of memory in merchandising

Studies have demonstrated that seeing is a conditioned process — that 80 per cent of seeing is actually memory of something seen before, while only 20 per cent is the immediate visual experience of seeing. This is the reason why a product's "recognition factor" is so important; it helps recall to the prospective purchaser's mind, at the point of sale, his previous experience of reading, and being sold by, the advertisement for the product.

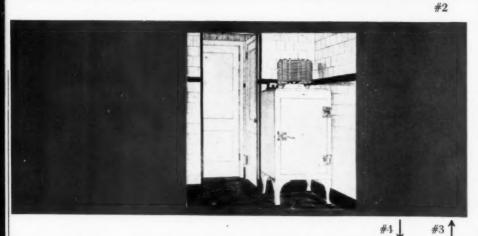
Giving a product an immediately recognizable feature is the job of the designer. And just to show how effective design can be in recalling brand

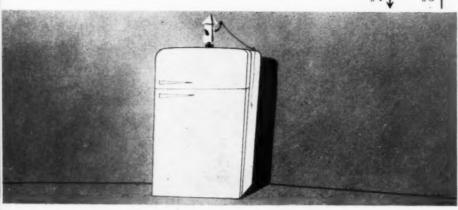


MPM MAY . 1957









names, here is another picture of a household appliance (Picture #3). Nine out of ten people can identify this almost immediately as a General Electric refrigerator, in spite of the fact that this model has not been made or advertised for more than twenty years. They recognize it — and can name it — because of the distinctive "Monitor Top" which for many years marked the GE refrigerator line.

Making a product instantly recognizable is perhaps the most important single thing a designer can do to give it a competitive advantage. But no product can be designed around unique appearance alone. Otherwise, it would be perfectly possible to design a refrigerator incorporating an 8-inch high brass whistle on its top (Picture #4). From the standpoint of recognition, this would be a wonderful feature: as distinct from all others, this refrigerator would be immediately, unmistakably, unforgetably recognizable. In mass display situations it would stand out dramatically. It would be a natural for advertising - a copywriter's dream.

In short, this highly recognizable special feature would be an asset in many ways, and clearly it would help dispel some of the confusion in the marketplace. There is just one thing wrong with it. It would not sell refrigerators.

## **Achieving believability**

It would not sell refrigerators because whistles have absolutely no relationship to refrigeration. And any attempt to associate the two would appear ridiculous to the public. In a word, it is not believable.

However, design can be both distinctive and believable. Here, for example, are Frigidaire's new "Sheer Look" refrigerators (Picture #5). They differ so sharply from other refrigerators by virtue of their square corners and straight, flat form that the visual association is immediate and the impression lasting. This is believable design because it is consistent with the function of refrigerators, and consistent, too, with high-styled, built-in modern kitchens.

Design, in this instance, has taken a long step toward lessening the confusion in the marketplace.

Take another example — the vacuum cleaner. Here's a picture of five best-selling models (Picture #6). Which one seems most immediately identifiable?

Four out of five people who have seen this picture identify the Lewyt

cleaner first. What makes this cleaner immediately recognizable to them is the special design feature of the big wheels which make the job of cleaning easier for the user. In other words, this special feature, incorporated into the design, satisfied the requirements of both recognition and believability.

Manufacturers in increasing numbers are discovering that immediate recognition is of vital importance. Here, for example, is GE's 1956 vacuum cleaner (Picture #7) — a radical and recognizable departure from all of their earlier models.

## The dilemma of the new look

The designer's job would be tough enough if his only problem were that of selecting one or more recognizable, believable features and integrating them into the final "look" of the product. But there is another problem which arises periodically to make his assignment even tougher.

This problem stems from the nature of modern merchandising which demands the periodic appearance of new models. The "new look" is a fundamental part of selling today - but it sets up an almost continuous "design dilemma."

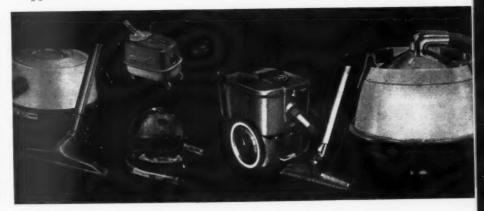
As we have just seen, recognition is a vital factor in triggering the action to buy. Obviously, however, recognition - by its very nature - is opposed to the need for changing the look of a product every so often. The problem then is how to "change the look" without really changing the look.

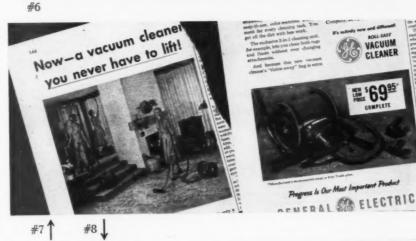
This dilemma is not insoluble — by good design. One of the more obvious, yet most important ways of retaining brand identity in spite of model changes is the trademark, as applied to a nameplate. Trademarks, like that of RCA-Victor (Picture #8), when featured in advertising and when repeated unchanged from year to year, can do much to help promote recall of advertising at the point of sale. GE also uses its trademark with laudable consistency. So does Royal Typewriter Co., Westinghouse, and many other firms.

But trademarks, too, have their rigid set of requirements. They must be immediately recognizable - and they must be consistent wherever used, whether on billboards, calling cards, trucks, packages, nameplates or in advertising.

Chrysler offers a dismaying example of how trademarks, as applied to a nameplate, may be misused. In 1947, or instance, their mark as used on the









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**TERMINATION** with appropriate end closures (above and below) puts the finishing touch on almost any moulding design.



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front of the car was a narrow, vertical "shield" with two diminutive horizontal wings. On the 1952 models, the Chrysler identity established earlier disappeared. Now the front of the car proudly bore a pair of "wings" in the form resembling the Cadillac "V." Two years later, a completely new crest was added to the wings. And in 1956 everything was different again. Now it was a stylized flying figure. Worse, this new figure was not even faintly related to the "Forward Look" symbol on which the company had spent so much money, and which it was continuing to promote.

If Chrysler is an example of how not to handle a trademark, Cadillac comes pretty close to being the opposite. The Cadillac "V," for instance, has changed slowly through the years, but because it remained consistently a "V," it has never lost its recognition value.

## **Building quality into a product**

Another way to overcome the problem of model changes is to build some "thing" - some quality - unmistakably into the product itself. This too has been done successfully, even in the rapidly changing automobile field. Take Cadillac again and the "fishtail" design of the rear fender. This has been used, with minor variations, for years. And as a result, although a new model appeared each year, the design itself said "Cadillac." This firm's long-term policy of building unmistakable recognition into every car has paid off. Cadillac today is one of the most easily identified - as well as one of the most highly desired - cars on the road.

Clearly, not every table radio, food mixer, washing machine or vacuum cleaner can be a Cadillac in appearance. But with good design each product can be given its own distinctive, believable, consistently used feature.

What we, as designers, are protesting is the confusion in today's marketplace caused by too many "me, too" products — products that look alike, that lack features which might motivate a positive, dynamic consumer response (See lead photo).

In short, too many products — from large appliances to small personal objects — have little value from the standpoint of recognition, believability and consistency. These are factors we know are absolutely necessary to motivate a significant sales response.

And they are factors which, when intelligently used and promoted, can help end not only the confusion in the marketplace, but the confusion among the customers.



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MAKE YOUR OWN COMPARISONS OF PERFORMANCE, QUALITY AND COSTS. WRITE FOR COMPLETE SPECIFICATIONS.



# KING-SEELEY CORPORATION

ANN ARBOR, MICHIGAN





# LEATHERNECKS FAIL TO FLAKE TI-CO



Close-up inspection of the bullet holes in TI-CO. Not one sign of coating failure.

Two husky Marines teamed up with a Browning .30 caliber machine gun to pour two hundred rounds of armorpiercing ammunition into a sheet of Inland TI-CO galvanized steel.

Despite the smashing contact of slug after slug, TI-CO showed not a crack, not a chip, not a trace of peeling or flaking. The protective zinc coating on TI-CO stayed put...to the very edge of the holes.

If speeding bullets fail to flake TI-CO...you can be sure that even the most severe fabricating operations or the roughest, toughest handling will not flake TI-CO's coating. That means positive protection for the base metal. No chance for rust to get a foothold.

# Switch to TI-CO galvanized sheets save manufacturers up to 15%

TI-CO eliminates re-dipping . . . painting . . . plating and improves saleability of products



1. Well-known garage door manufacturer reports cost-savings of more than 10% when they eliminated plating operations on hardware by changing over to TI-CO galvanized sheets. Change resulted in a good looking, more durable product, too.



2. Previously, this roller gravity conveyor was made from hot rolled sheets and then it was either zinc-dipped or painted. Now, it's fabricated from TI-CO and the costs of dipping and painting have been removed. Non-flaking TI-CO also adds important sales feature of positive insurance against corrosion.



3. Leading furnace manufacturer saves \$20.00 per thousand, or approximately 15% of total costs, on the production of this plenum take-off since he switched from cold rolled sheets to TI-CO.

TI-CO takes the tough 4-inch draw in stride with no flaking of the protective zinc coating. Cleaning and painting of product after forming have been eliminated.

Wherever corrosion resistance is a requisite in a product, non-flaking Inland TI-CO galvanized sheets offer important advantages to the manufacturer in reduction of costs and in product improvement. This is because TI-CO can take any fabricating

operation that can be performed on cold rolled steel without flaking of the zinc coating.

If you are presently manufacturing or designing a product in which corrosion resistance is a factor, it will pay you to investigate TI-CO galvanized sheets.

TI-CO is manufactured in coils and cut lengths with oiled or chemically treated surfaces. For complete information, consult your local steel distributor or Inland sales representative.

Write today for a free informative booklet on TI-CO to:

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A new multi-pass, conveyorized, Burdett Finishing System — jointly engineered by Mr. Henry H. Cormier, Fansteel's Process Project Engineer and Burdett Engineers — contains in 1,000 sq. ft., the facilities which normally would require 5,000 sq. ft.

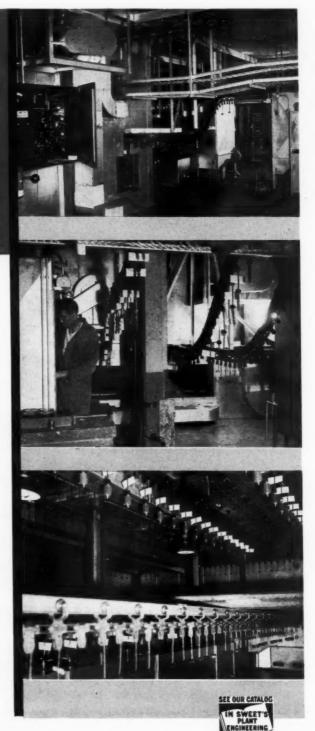
Featured are air-stream heated ovens employing the famous Burdett "Radiant Heat" Burners for extreme economy, dip-spin finishing and conveyorized handling of products of manufacture.

RESULTS — night crew eliminated . . . former daily unit output now produced by one-half the former personnel requirement without added effort . . . plant potential increased by 40% to 50% . . . all this and greatly increased production too!

The total cost of this project included: revamping of material flow system; dismantling old equipment; cost of new equipment and cost of an additional three compartment batch oven to accommodate production requiring truck handling. The system has eliminated production traffic jams and constant re-positioning of trucks to move scheduled loads — thereby reducing the material handling problems to a minimum.

# MORAL:

When you have a finishing system problem — BE SURE to consult Burdett Engineers



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The Ambassador hotel, Los Angeles, where the Tenth Western Metal Congress was held.

# Tenth Western Metal Show and Congress tops all records

by Gilbert C. Close . WESTERN EDITOR

NEARLY 75,000 visitors clicked turnstiles at the 10th Western Metal Exposition, held March 25-29, at the Pan-Pacific Auditorium in Los Angeles, Calif., to view more than 400 technical exhibits running the gamut of the mechanical sciences. Attendance at the show was an all-time high, exceeding by about 20,000 the attendance two years ago.

During the same five-day period, more than 100 speakers, representing the cream of the nation's experts in the various mechanical sciences, delivered papers at the 10th Western Metal Congress, held nearby at the Southland's famed Ambassador hotel.

Societies represented at the Metal Congress included American Society for Metals, American Welding Society, Society for Nondestructive Testing, Industrial Heating Equipment Association, and Metals Branch — American Institute of Mining, Metallurgical and Petroleum Engineers. In all, the western sections of 37 national technical societies aided in sponsoring the event.

William H. Eisenman, national secretary, American Society for Metals, and managing director of the Exposition and Congress, said that the show was the most educational and informative exhibit yet presented by the metal industry of the west coast. Most of the planning was done by western men so that the sessions would deal with questions geared to western needs.

Most of the papers delivered at the Metal Congress dealt with topics directed to aircraft, missiles, rockets, satellites, electronics, and the chemical and petroleum industries — all vitally important in the west coast area. Thirty papers were delivered by members of the American Welding Society alone, because welding plays such an important role in most of the above industries. Ultra-high temperature materials, ultrasonic mechanics, and automation also came in for a great deal of discussion.

A special five-day titanium conference, conducted by ASM's newly-created Metals Engineering Institute, under the direction of Dr. Anton de S. Brasunas,



William H. Eisenman, national secretary, American Society for Metals, and managing director of the Tenth Western Metal Show and Congress.

covered every angle of titanium and its use. Both the metallurgical and mechanical properties of titanium were

# Which panel took the longest salt shower?



Above, unprotected steel panel (left), degreased and painted—exposed to 96 hours of salt spray, compared to panel (right) protected by Pre-Fos before being given identical coat of paint and exposed to 250 hours of salt spray!



J. B. FORD DIVISION

# The one on the right— the steel panel protected before painting by Wyandotte PRE-FOS®

The painted steel panel showing by far the least corrosion damage was exposed to A.S.T.M. standard salt spray 154 hours longer than the badly rusted one! . . . proof of the effectiveness of Pre-Fos in the preparation of metals for painting.

Wyandotte Pre-Fos simplifies processing by cleaning and phosphating in a *single* operation; deposits a fine-grained, corrosion-resistant iron phosphate coating, which saves paint and provides superior impact resistance.

What's more, Pre-Fos prevents rusting of "inprocess" steel parts; may be adapted for spraywashing or soak-tank use.

Improve your "finish" with Pre-Fos. Get details from your Wyandotte man, today! Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California. Offices in principal cities.

THE BEST IN CHEMICAL PRODUCTS FOR METAL FINISHING

discussed, along with the latest techniques in blanking and forming, machining, and welding. The future of titanium in civilian products was also discussed.

Among the more than 400 exhibits on display at the exposition, automation played an important role. Several firms exhibited shop machines fully controlled by programmed magnetic tape. Tape controls for testing machines, analyzing equipment, and quality control equipment were also demonstrated. Several firms exhibited ultrasonic cleaning equipment. Machines that would produce close-tolerance parts from powdered metal, and do it automatically after the initial setup, drew a lot of interested attention. One firm exhibited an automatic hydraulic tracing attachment which would "feel out" and trace the outline of a guide template without human assistance.

In a spot-check of visitors on the floor at the Metal Exposition the concensus of opinion was . . . "it's the best show we've ever had in this area!" Follow-up questions revealed that it was thought to be " . . . the best show . . . " largely because most of the exhibits were dynamic rather than static. Machines were actually working at full capacity, new welding and brazing alloys were being demonstrated rather than shown, and automatic machines were actually machining parts without an operator.

One elderly engineer, a veteran of many metal shows, summed up this reaction in a single statement . . "You can't tell much about a machine by looking at it. You've got to see it in action.

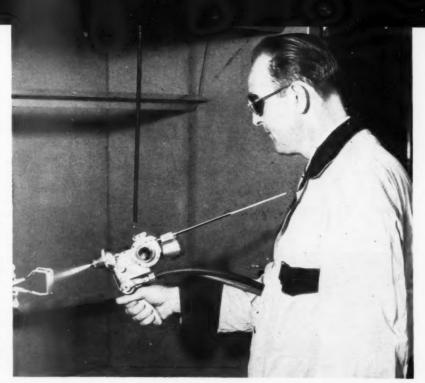
To top off the twin event, and give it official status, Mayor Norris Poulson of Los Angeles proclaimed "Western Metal Week" to run concurrently with the

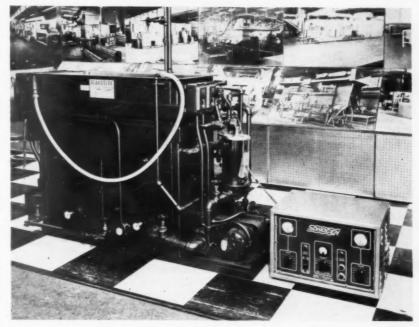
Top: Operator applies ceramic spray coating on a sample part in a small production paint booth.

Center: An ultrasonic metal cleaner, backed by a display panel of pictures showing various ultrasonic metal cleaning installations, operates in full view of visitors.

Right: Partial floor view in the Pan-Pacific Auditorium. The exhibits overlowed into four large adjacent pavilion

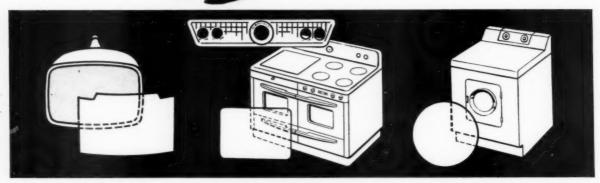
tents.







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# **Opportunities for market development** through trade associations

fourth in a series of articles on cooperative trade association activity

by William H. Withey . ARMCO STEEL CORPORATION

TRADE associations and their purpose in life have been the butt of a good many jokes over the years. And certainly some of the stories were more true than funny. However, today many associations are proving that they can perform a very vital function for their members. That is collective market development - increasing the total opportunity for the entire industry. Consider this quote:

"There is great strength in numbers and in mutual cooperation . . . many activities can be engaged in to promote our industry on the association level that would be impossible for us to attempt as individuals. Giving of our time, effort and money in a common cause can pay us great dividends."

Those words were spoken at the 1955 convention of the National Association of Architectural Metal Manufacturers in Colorado Springs, by President Harrison Graver. Certainly no truer words were ever spoken about the role of trade associations, especially as it concerns market development. In fact, those words are virtually gospel at Armco. As a basic steel producer, their growth potential must be measured by the potentials of total industries rather than individual companies.

Therefore they have devoted a great deal of their market development effort over the past 50 years to organizing and assisting in the development of trade associations in the many important industries they serve.

By such joint effort, Armco's experience shows that one can expect to gain these five benefits:

- 1. The entire force of industry's effort is concentrated in the direction of greatest benefit.
- 2. All members benefit by the thought and effort of each individual com-
- 3. Objectives are accomplished more

- economically by eliminating multiple duplication of time and expense.
- 4. Such cooperative work offsets similar effort on the part of competitive associations.
- 5. The enthusiasm thus developed not only has a stimulating effect · on the association as such, but also on the member companies and individuals.

It will be necessary for everyone to continue to support these efforts - and the men who have made them possible if their full value is to be gained and if we are to get the dividends that should be expected from the investment to date. For certainly, lack of cooperation by the members is the greatest pitfall to successful cooperative market

There's not much advantage in being 'joiner." If an organization is worth belonging to - it's worth working for.

Here are some of the ideas which have worked for cooperative groups and might be put to work for others.

# What should be done collectively:

1. First set the goals. What is it that needs to be accomplished?

Expand present markets Develop new markets Improve our products

All of these are appropriate areas for association development.

- 2. Once having determined the goals, the next step is to study the markets. Determine where the greatest growth potential lies. Perhaps the greatest potential growth market is not the largest actual market today. This is not a new idea - the fact that the name of this Association once included the words "ornamental iron" proves that you have recognized changing markets.
- 3. Study products to see how they fit present and potentially-big markets.



THE AUTHOR

4. Finally, develop a fully integrated promotional program that will supplement but not duplicate individual company effort.

# An Institute case history

If there are any doubts as to what can actually be accomplished by such a program, refer to the Porcelain Enamel Institute. About ten years ago they embarked on just such a program. One of the markets they discovered that offered unusual possibilities was curtain wall construction.

They instituted a market development program and one by one the bolder companies began to enter the field. People who had been enameling signs and table tops suddenly began learning architects' lingo. Examine the results. Look at almost any city and you'll find porcelain enamel curtain wall jobs multiplying - well, almost as fast as rabbits. And the figures prove what your eyes see:

1940 — \$1 million

1950 - \$10 million

1953 - \$25 million

1956 - more than \$40 million

# Implementation is the job:

The manner of accomplishing such a program is easy to outline but requires a considerable amount of work to Page 78 ->

41

one of the country's most modern facilities for processing specular and diffuse aluminum reflector finishes is described in . . .

# **Alzak processing at Curtis Lighting**

by William Weibel . ILLUMINATING ENGINEER, CURTIS LIGHTING, INC.



THE ALZAK PROCESS has grown steadily in customer acceptance since it was developed by the Aluminum Company of America in the

early 1930s. Curtis Lighting, Inc. worked very closely with Alcoa, and was active in developing details which assured satisfactory processing in full scale production.

As a result of this activity, Curtis was issued the first license for the Alzak process. Since that time (1934), Curtis has gained an enviable position in the field as the result of the huge volume and extensive variety of work processed.

Technical knowledge of the process and plant facilities alike have grown with the years. Last year a \$150,000 program of improvement was completed. The present processing facilities rank as one of the largest and most modern in the country. The Curtis Alzak Department contains 6,000 square feet of working space and has a capacity of more than 1000 racks per shift. Each rack can be loaded to 60 sq. ft. of aluminum to be processed.

#### The Alzak process

The Alzak process consists essentially of the brightening, formation of aluminum oxide, and the sealing of the surfaces. Alzak specifications are based upon the use of a special high purity alloy called "reflector sheet." The high purity is essential. Impurities, in other than the most minute amounts, will adversely affect the appearance and reflectance of the resulting surface.

Curtis luminaires made of aluminum are available in mirror finish with high specular reflectance, or in soft matte with high diffuse reflectance. For the matte surface, the reflector sheet used is homogeneous throughout. For the specular surfaces, a "clad" reflector

sheet is used which has one side of very high purity aluminum.

Each of these two types of sheet are stocked in various tempers suitable for forming, drawing, spinning, or stamping reflectors and other parts required in the manufacture of a wide line of lighting fixtures for offices, schools, stores, and factories.

All fabrication of the reflectors is completed before they are Alzak processed. This eliminates objectionable tool marking. The specular or diffuse surfaces are of uniform appearance. The resulting aluminum oxide surface is clear, colorless, continuous, hard, and remarkably resistant to abrasion.

# Care in parts designing

In the design of parts to be processed, care is taken so that tight beads or folds are kept at a minimum to avoid retention of solutions during processing. Tools and dies are designed to minimize to the fullest any tool marking. The process, unlike painting or plating, does not deposit material on the reflector surface and so does not mask tool marks. In handling the reflectors through the various stages of the process, it is important that they are securely held, both to insure good electrical contact and to avoid any damage.

#### Manufacturing procedures

The complete flow chart for the processing of aluminum in this operation is detailed in the accompanying diagram. It would be well to pinpoint the two vital stages of the process and then follow the operation completely through for full understanding of operation.

The two points are the two electrolytic stages of the process. The first stage is for brightening. This is accomplished by placing the parts in an acid solution and connecting them electrically. Under controlled conditions of time, acidity, temperature, and current density, a thin film of metal is removed along with any impurities that might have remained on the surface after cleaning.

In the second electrolytic stage, aluminum oxide is formed from the aluminum itself. These two steps are further detailed in the following description.

# Preparation of the metal

The aluminum used for reflectors and other luminaire parts is purchased in coil and sheet stock, usually of 0.040" thickness. The parts are blanked, punched, drawn, spun, formed, etc., before processing.

Parts which have excessive oil or grease deposit are cleaned in a detergent solution, or by vapor degreasing. Reflectors made up of the "clad" reflector sheet are polished and buffed. Buffing is also used on some parts to provide specular bands or areas to contrast with other areas on the part which have been emeried or etched. Buffed parts are thoroughly cleaned in a hot detergent solution. Cleaning in a solution is necessary as the high-purity aluminum surface is too soft to permit mechanical cleaning.

#### Racks are major concern

The racks used in the Alzak process are custom-made in the plant. The basic design is adapted for the wide range of shapes and sizes of aluminum parts to be processed. All rack parts — structural members, screws, bolts, rivets, and contacts — are made of aluminum so as to avoid contamination of the many and varied solutions used in the process.

Twin overhead monorail cranes, with the assistance of electric hoists, permit large rack loads to be handled rapidly and safely through the many steps of the process. Electrical controls, timers, and automatic temperature control equipment are fully utilized to insure uniformity and high quality in the finished product.

Tanks, 9 feet long, 6 feet deep and 42 inches wide, holding solutions with depths ranging from 60 to 66 inches, are located off the floor in a close-proximity parallel installation, with steel grid walk areas along the entire area. Tanks are made of steel, stainless steel, or lead lined carbon steel as required by the wide variety of solutions used. Fume control is carefully engineered, and most of the tanks have individual exhaust systems.

# **Procedures of process**

The method of producing "specular" finish differs somewhat from that used for the matte finish up to the first electrolytic stage, with both types following the same steps in the remaining stages. Parts are fastened by spring clips on the racking frames, which are designed for the part to be processed. Then, by means of the monorail electric hoist system, the racked parts are started through the various stages of the process.

The parts requiring diffuse finish are etched in a hot caustic solution, rinsed and cleaned in a nitric acid solution. The parts requiring specular finish are cleaned in a hot detergent solution. Following these initial steps, all parts are rinsed and are ready for brightening.

The racked parts are immersed in a solution of hydrofluoric acid for a 12-minute period, with the bath temperature set at 68° F. The tank is lead



lined, and heat is provided by copper cathodes, with current density at 12-20 asf, operating at 14-35 volts.

A synthetic fiber cloth diaphragm serves as a barrier to prevent gas streaks which would mark surfaces of the parts. Current density, acidity, temperature, and time are carefully controlled, and all surfaces of the reflector in contact with the solution are electrolytically brightened.

This stage is essentially a de-plating operation with a thin film of metal being removed. Also removed are any remaining impurities from the process of fabrication and polishing. This electrolytic brightening step is an essential feature of the Alzak process.

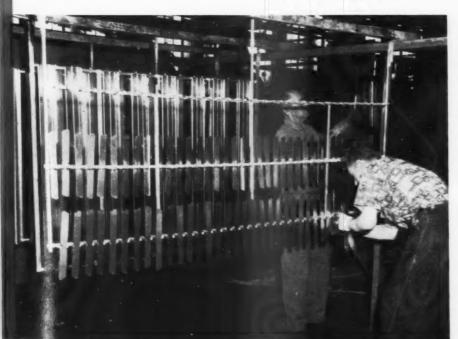
In this stage, there must be no motion of the rack, the reflectors, or the solution, as such motion will result in a cloudy surface on the parts.

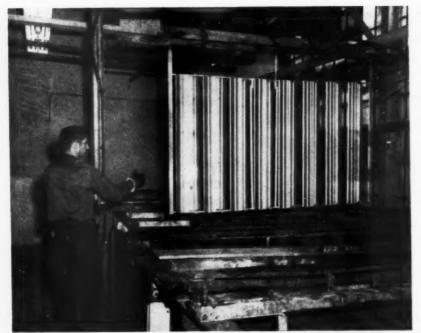
Above: All parts to be Alzak\* processed are completely prefabricated so that all surfaces (inside punch holes, edges, etc.,) will be properly processed before finishing.

(\*A proprietary term of The Aluminum Company of America.)

### MPM Photos

Left: Racks for processing the parts are constructed from aluminum stock, with special racks designed for each different part. Parts are held in position by spring clips which serve three purposes: quick rack loading; firm grip on piece so that it will not move during the processing; and positive electrical contact.





All parts are carefully racked to assure complete draining of solutions, and to prevent carryover from tank to tank.

One result of this procedure is a very thin film of aluminum oxide upon the surface of the parts. This film, if allowed to remain, would appear as a soft and chalky coating and would smudge with handling.

Removal of this "smudge" is done by dipping in a phosphoric-chromic acid solution, air-agitated for a period of 1 to 2 minutes. Bath temperature is maintained at 1850° F.

After being thoroughly rinsed in an air-agitated, flowing cold water bath for a short period, the reflectors are then ready for the second electrolytic process. Here again the current density, acidity, temperature, and time are under careful control. In this stage, aluminum oxide is formed from the aluminum itself and covers all those aluminum surfaces which are in contact with the solution and are carrying current. Unlike a plating operation, no material is deposited on the metal surface.

#### How oxidation is accelerated

The first oxide formed is on the outer surface of the aluminum. It grows in thickness only if the aluminum sheet under this oxide layer is exposed to the action of the current and the acid solu-

#### MPM Photos

A double monorail system, with manually operated air hoists, provides for movement of racks through the several stages. In the foreground is a row of spray nozzles which line the top edges of the rinse tanks to assure a complete rinse for each part.

tion. This exposure is achieved because, although the oxide is a nonconductor, there are many small pores in the oxide surface which permit the acid solution and the current to continue to reach into the aluminum, forming more aluminum oxide.

This step is handled in a lead-lined tank, with a 15 per cent sulphuric acid solution maintained at a temperature of 68° to 76° F., with cold water and automatic temperature controls maintaining the bath temperature range.

Air agitation assures uniformity of temperature in the solution. Current density is set at 10 to 12 asf with 15-22 volts used. The lead-lined tank serves as the cathode in this operation.

The aluminum oxide surface at this stage of the process is very porous. Such a surface would not be a practical finish for aluminum reflectors as it would be absorptive and its initial reflectance could not be maintained.

The sealing of the surface is done by immersion in neutralized tap water for a 5 to 10 minute period, depending upon the thickness of the oxide. The sealer tank is equipped with an aluminum liner, and water temperature is maintained at 180-185° F. The hot water bath converts some of the aluminum oxide to aluminum monohydrate, with probably some increase in volume, which serves to close the pores.

Uniformity of operation is provided by loading each rack so that it will contain 50 to 60 square feet of metal surface for treatment. A non-conducting anodic coating is formed on these racks during processing and must be removed before the rack is used again. This is done in a solution of phosphoric and chromic acid.

To insure good electrical contact between the rack and the rectifier system, the rack contact surface is cleaned by

to column 1 next page ->



#### ALZAC CONTINUED

using emery cloth mounted on an air sander. This cleaning is accomplished during one of the rinses when no electrical contact is needed.

Each complete processing cycle results in some aluminum being removed from each rack part. It is the responsibility of the maintenance crew to check each rack — discard, repair, or rebuild as required — so that each aluminum reflector or part being processed is held securely and conducts current as required.

### **Handling of solutions**

The two tanks of solution used for the electro-brightening processes are carefully watched since the solution life is a matter of a few weeks. Free acid concentration is controlled at all times, and the bath is discarded after analysis shows that it has passed the critical point.

A system of rotation is used on these two tanks to provide for efficient operation. The new solution is used for parts receiving the specular finish, where processing time runs to 12 minutes. The "diffuse" finish parts, which have a 5 minute bath, use the older solution.

These two tanks are situated side by side, so it is just a matter of the operator being informed which tank is to take the different types during the processing.

# Thicknesses of finishes

Two types of finishes are typical. The difference in type is only a matter of degree. Heavy duty finish is accomplished by a 15-minute immersion in the sulphuric acid solution which provides a minimum of 7.5 mg. of aluminum oxide per square inch. A regular finish, formed in 8 minutes, has a minimum of 5 mg. per square inch.

These different thickneses necessitate a differential in sealing time, with heavy duty requiring 22 minutes, and regular needing only 15 minutes. The thickness of the oxide, within limits, varies with the current density as well as with time in process.

#### **Electrical requirements**

To provide the electrical requirements of the process, 1000-ampere normal rating rectifiers are used. These fill the requirements for both the electro-brightening and the formation of the final thickness of the aluminum oxide. The total current supplied is determined by the current density required,

and the exposed surface area of all reflectors and racks being processed at any one time.

#### Results of the process

The Alzak process with its electrochemical brightening, formation of aluminum oxide, and sealing, provides a surface that is hard, smooth, and resistant to abrasion and corrosion. The developed reflector contour or part shape, and the choice of specular, diffuse, or combination of surface treatment, provides the necessary light control or appearance. The silvery appearance is attractive and blends well in any decor.

The finish, with proper maintenance, is permanent and cannot peel or separate. Cleaning periodically with mild detergent or wax cleaners is recommended to maintain the original reflectance.

You can read about "The Organic Finishing System at Curtis Lighting" in the April issue of MPM, starting on page forty-six.





the vision of research becomes the product of tomorrow



A never ending search for product improvement is the byword here at Chicago Vit. Just one phase, but an important one in enamel development work, is the experimental smelting of new frit formalae which frequently are individualized to meet specific plant or product conditions—tailor made! From this meticulous work come new frits that bring many tangible benefits to Chicago Vit customers in the manufacture of all types of porcelain enameled products. 24 hours a day this experimental smelting department, whose capacity alone would be sufficient to supply the needs of several small plants, is working for you . . . to bring you better frits that help you pack more sales appeal into the products you build.

A section of the main room of the Research and Development Laboratory

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# A report on a porcelain enameled air marker

after nine years exposure on the roof of a plant at Nappanee, Indiana

Just about nine years ago, in the June, 1948 issue of this publication, we reported on an inspection trip what was described as "the country's most unusual porcelain enameled air marker—unusual in concept and execution."

The marker is located on the roof of the Vitreous Steel Products Company plant in Nappanee, Indiana. It was originally installed by the Vitreous Steel organization as a result of the company's interest in co-operating on a project that would further the use of porcelain enameled steel for air marking purposes.

From a flyer's standpoint, the location seemed ideal inasmuch as the Vitreous Steel plant provided a broad expanse of roof surface for installing the marker, and the plant itself immediately adjoins a straight run of track of a mainline railroad (Baltimore and Ohio), and is near an equally-straight run of mainline highway (U.S. Route 6). It also seemed to offer a good exposure test for the porcelain enamel as it would be subjected to the normal exhausts from a porcelain enameling facility.

The project for using porcelain enameled air markers was discouraged to some extent by the critical shortage of steel. As a result came the idea of using rejected table tops—then a standard product of the Vitreous Steel plant. It was first determined that standard size tops could logically be developed into a marker to meet C.A.A. specifications.

First, a drawing was made of the proposed marker and checked with C.A.A. In the meantime, a program was inaugurated to save all rejected tops in sizes 25" x 40" and 32" x 42", and all table leaves size 10½" x 40".

It took several months to accumulate the required quantity but, in the meantime, all plans were completed so that when the required number of tops were finally available, the predetermined plan was carried out.

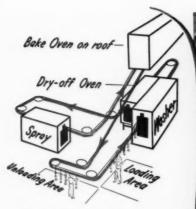
The specified number of tops and leaves were sheared to the shapes required for radii and angles in the letters. All parts were then given a coat of chrome yellow acid resisting enamel to meet C.A.A. standards for color. Cement was then poured onto the backs of all tops and the cement held securely in place by the return flanges. The resulting sections had a weight factor of

about 75 pounds — sufficient to prevent shifting even under extreme wind conditions. The scale drawing was then transferred to the plant roof and the finished sections laid in place.

One hundred and ninety-one tops, sizes  $25'' \times 40''$ , were used for the town name and state, resulting in a sign 240' long, composed of letters 20' high with a stroke of 25''. Twelve  $25'' \times 40''$  tops were used for the North arrow. One hundred and twenty-three  $10\frac{1}{2}'' \times 40''$  table leaves were used for the figures indicating longitude and latitude. Fifty-two tops,  $32'' \times 42''$ , were used to form the South Bend arrow.

Of interest to enamelers was the fact that in order to avoid the necessity of cutting stencils to form the individual letters (black on the chrome yellow background), the letters were laid out on the background, black acid resisting enamel applied with an ordinary paint brush, and the tops refired.

Although the sign was made up of multiple components, individually placed, it is impossible from the air to see any "break" in the continuity of



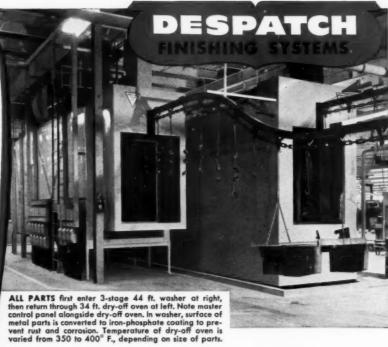
FLOW DIAGRAM shows perspective (not actual scale) of new metal processing and paint finishing system in Tennant's new plant. Conveyor is 500 ft. long. The 74 ft. bake oven is built on the plant's roof to save floor space. Just-sprayed parts travel up and into the oven through its underside opening. Baking lasts eight minutes at 330° F.



CONVEYOR SPEED of 8 ft. per minute gives sprayers time to handle basket loads of small parts or large frames such as shown in photo. After prime coat is sprayed and baked on, parts go through system again (washer is temporarily shut off) for spraying and baking of the finish coat.



74 DIFFERENT PARTS, each twice sprayed and baked, are in this new Tennant Model "80" power sweeper for industrial use. The "80" goes anywhere, gobbling up dirt, debris, dust and litter. It features optimum design for most plants; will clean 19 out of 20 plant aisles in not more than two passes!



# From 80 man-hours to 24... FASTER, BRIGHTER PAINTING OF 1000 DIFFERENT PARTS!

The G. H. Tennant Company, Minneapolis, used to have trouble painting production quantities of 1000 different metal parts for their power sweepers, floor machines, scarifiers, roof scrapers and concrete routers.

This new Despatch continuous-conveyor finishing system speeds washing and drying of all parts (they weigh from ounces to 800 pounds) and speeds spraying and baking of the prime coat and the bright orange or cream finish coat.

The system enables Tennant to do in 24 man-hours what used to take 80 man-hours, and assures a superior finish.

The entire system was engineered, built and installed by Despatch in cooperation with the Tennant Company. Despatch can help you. There's a Despatch-trained resident engineer near you. Why not talk to him about your finishing requirements?

# Write today for Bulletin 51

16 colorful pages on modern ways to achieve better finishes, faster production and smoother handling of metal products . . . at lower cost.



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PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY



# GAMA twenty-second annual meeting

Over five thousand tulips add to the beauty of this small section of the grounds at the Greenbrier, White Sulphur Springs, W. Va., scene of the GAMA meeting.

gas appliance manufacturers discuss competition and plans for educational programs, public relations, publicity, advertising, and cooperative selling efforts . . . hear utility and manufacturer speakers call for unity

by Dana Chase . EDITOR MPM

O VER four hundred delegates attended the 22nd annual meeting of the Gas Appliance Manufacturers Association held at The Greenbrier, White Sulphur Springs, W. Va., April 8, 9 and 10. The program committee, under the chairmanship of Frank H. Post, Robertshaw-Fulton Controls Co., had arranged a well-balanced program of morning meetings, afternoon sports events, and evening social activities. Other members of the program committee included Frank Meyer, Meyer Furnace Co., George Wolfe, Sunray Stove Co., Norman Millard, Philco Corp., Walter G. Ullman, The Siegler Corp. and C. E. Blome, Metalbestos Div., William Wallace Co. Inasmuch as the wives of the majority of the delegates were in attendance, a special ladies entertainment program had also been arranged.

Special division meetings were held by the following divisions: Domestic Gas Range, Automatic Controls, House Heating, Gas Vent and Chimney, Gas Wall and Floor Furnace, Incinerator, Valve, Furnace, Boiler, Direct Heating Equipment, Water Heater, Appliance Regulator, Clothes Dryer, Conversion Burner, Unit Heater and Duct Furnace.

# Rheem Executive to head GAMA

Clifford V. Coons, executive vice president of Rheem Manufacturing Co., was elected president of GAMA to take office in October. He will head the group of manufacturers who represent the six hundred member companies reported to account for more than ninety-five percent of the nation's output of residential, commercial and industrial gas appliances and equipment.

Edward A. Norman, Jr., president of Norman Products Co., Columbus, Ohio, was elected first vice president. Wendell C. Davis, president of Cribben and Sexton Co., was elected second vice president, and Stanley H. Hobson, president of Geo. D. Roper Corp., was reelected treasurer. Incoming president Coons has been with Rheem since 1934, where he was elected vice president in 1948 and a director in 1950 and executive vice president in 1956. He is vice president and a director of the Steel Shipping Container Institute and is active in the affairs of the National Association of Manufacturers, American Gas Association and the Newcomen Society (see "Marketing and Merchandising" by Clifford V. Coons in the SpeA smile from incoming G A M A president Clifford Coons, executive vp at Rheem Mfg. Co.





cial Rheem Section of the January, 1956, issue of this publication).

# President Klein reports on government housing study

The findings of a government survey conducted by the Bureau of Labor Statistics at the request of the gas industry were reported by Julius Klein, president of GAMA, during the annual meeting. The report indicated that of 218,600 one-family dwellings studied, gas house heating had been adopted in seventy-two percent of the dwellings.

The report showed that seventy-six percent of the new dwellings built during 1956 were equipped with gas water heaters and that gas ranges enjoyed a



Left: Dean Madden of A. W. Cash Valve Co., receives a certificate representing a meritorious service award from GAMA president Julius Klein.

Center: At the speakers table at a GAMA general luncheon meeting are: (left) Lyle Harvey, Stanley Hobson, and Ned Norman. (Right) Cliff Coons and Sheldon Coleman.



three to one majority over competitive ranges in homes selling under \$12,000. Electric ranges outsold gas models in houses selling at higher prices.

The GAMA president stated that in homes in non-urban areas, served by electricity but not on gas mains, LP-Gas would play an increasingly important part. This market, he said, is the target of the Gas Unity Committee, a cooperative group of utilities, LP-Gas distributors and appliance manufacturers leading a drive to "bring gas service to consumers — wherever they live."

Klein urged GAMA members to intensify their sales efforts in the builder-architect market, because, he said, "the builder is a prime shopper for appliances in both the new homes and modernization fields, and his opinion largely determines the success or failure of our offerings."

Klein urged the industry to avail

itself of every opportunity to equip housing-development model homes in all price classifications.

"We must recognize the fact that the model home not only helps sell the development to new home buyers but also provides a pattern for modernization of existing homes," he said.

"The public has demonstrated in many ways that it wants, and will pay for, an upgraded product, especially when that product is essential to better living," he continued.

The GAMA official pointed out that while electric house-heating amounted to less than three percent of the new home market, electric industry promotion of heating is being intensified to balance load patterns distorted by heavy summer use of air conditioning.

# AGA president cites potential

Clare H. Zachry, president of the

American Gas Association and president of Southern Union Gas Company, Dallas, Texas, addressed the GAMA meeting on the subject of industry unity.

Zachry briefed a recent market survey and forecast by AGA which shows the potential market for gas appliances as tremendous. He cited the following figures as typical examples: Possible sales of 300 million units by 1975 more than three times the total number of appliances in use at the present time. The figures include a potential of 94 million ranges, 80 million water heaters, 25 million central heating units, 20 million floor and wall furnaces, 54 million space heaters, 17 million clothes dryers, and 5 million gas incinerators. "But", he stated, "while these potentials represent a brilliant target to shoot at, they won't become realities automatically. We still have to transform potential sales into actual sales."



Harold Massey, managing director of the association, pays close attention as Pam Snyder, kitchen planner of the future, shows kitchen equipment arrangement.



Here is a typical grow

Fifteen GAMA divisions elected division chairman and vice chairm



Right: Paul Hammond, chairman, PCGA manufacturers section, is one of the proud recipients of a meritorious award. Awards were presented at the president's dinner to F. S. Cornell, Earl B. Cutter, Wendell C. Davis, Fred H. Groen, Jr., Paul Hammond, Dean E. Madden, Frederick H. Martin, Frank Osborne, W. F. Rockwell, Jr., Karl W. Schick, and A. F. Smith.



The AGA president placed the responsibility firmly on the shoulders of the manufacturers for supplying advanced appliances necessary to meet competition. It will be up to the gas distributors, he said, to render the best possible service by making increased supplies of gas available and by cooperating to bring gas to everyone everywhere in the country.

Describing how unity of purpose is already in operation, Zachry referred to the GEM program of advertising promotion and publicity conducted by the gas equipment manufacturers. He also referred to the Gas Industry Development Program, jointly sponsored by AGA and GAMA, one of the aims of which is the development of utility company leadership in the merchandising of gas appliances (the GID Program was organized under the leadership of J. Theodore Wolfe, president of Baltimore Gas

and Electric Company, Baltimore, Md., and the GAMA Gas Industry Development Committee under the direction of Wendell C. Davis, president of Cribben and Sexton Co., Chicago).

This speaker referred to the automatic top burner heat control as the greatest advance in the modern gas range in the last thirty years. "This device, in effect, makes every pot, pan and cooking utensil an automatic appliance," he said.

# "Jack the giant killer"

A formal paper by Carl Sorby of the Geo. D. Roper Corporation was distributed at the meeting following a presentation by Stanley H. Hobson, Roper president. The "Jack the Giant Killer" title was used to describe the National LP-Gas Council sponsored by LPGA, GAMA and NGA (National Gasoline Association). The Council is an organization for promotion to consumers.

In his formal statement Mr. Sorby outlined the National LP-Gas Council as an organization devoted to helping sell appliances, LP-Gas equipment, and the fuel itself.

Sorby offered this organization as an excellent example of gas industry unity, where hundreds of LP-Gas producers, marketers, appliance and equipment manufacturers are pooling their funds to help sell their products for the common industry good.

Included in this program activity is national advertising in home magazines and a "grass roots" public relations program to reach weekly newspapers, radio and TV.

The Council is under the chairmanship of Donald O'Meara, sales manager of the Pyrofax Gas Corp.

The next GAMA annual meeting will be held in late March of 1958 and is again scheduled for The Greenbrier.



Paul Hammond, (left)
vp, Holly Mfg. Co.,
and Leigh Whitelaw
(right), executive vp
of GAMA, seem pleased
with what President
Julius Klein is spelling out for them.



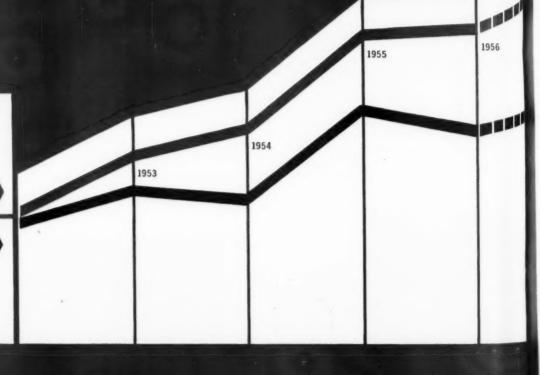
GAMA conventioneers.

rs. Names of the newly-elected libe announced in the June issue.

# Big things of hopening in porcelain enamel on appliances

PORCELAIN ENAMEL PRODUCTION (Sq. Ft.) IN APPLIANCE FIELD

"RETAILING DAILY" MFRS. SHIPMENT INDEX





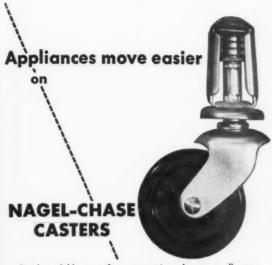
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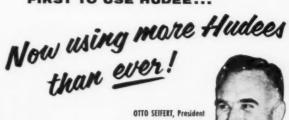
Manufacturers of Nagel-Chase Casters
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# IN A NUTSHELL..

"Specials" to your design!



FIRST TO USE HUDEE ...



OTTO SEIFERT, President Beautility Corporation Chicago, Illinois



Mr. Seifert says: "At Beautility Corporation, where we manufacture great numbers of custom countertops and built-in kitchen and bathroom equipment, including our famous lavatory unit, we feel that HUDEE Frames are a most important part of every installation! We were the FIRST to use HUDEE way back in 1946. We're now using more HUDEES than EVER! The HUDEE Frame system has made possible the extensive, safe use of everything MODERN in counter-tops."

# Hudee

the Standard of Quality

Hudee, the original clamp down frame system offers many advantages. When Hudee is used for the installation of gas and electric built-in ranges and modern sink bowls, you are assured of trouble-free performance. Hudee guarantees the highest standards in quality manufacturing and installation features. Hudee leads with engineering advancements. When you use Hudee you are using the finest.



# Important corrosion factors in home laundry equipment

a discussion of types of corrosion on porcelain enamel in laundry units, and design characteristics affecting the corrosion

by E. E. Bryant . TECHNICAL DIRECTOR, FRIT DIVISION, FERRO CORPORATION

THE AUTHOR realizes that elimination of the cause of corrosion will also defeat the purpose of a laundry unit which is to wash clothes clean. However, it would seem that a better understanding of the problem involved should be helpful, and that the real challenge would lie in achieving superior washing action without excessive corrosive action.

Corrosion of the porcelain enamel surface in a laundry unit may be predominantly caused by one type of attack, or by a combination of two or three. The types are alkaline solution, solution by hot water, water condensate, and abrasion and gouging. Acid attack may be considered in rare cases, but generally, acid which will attack porcelain enamel will also deteriorate clothing.

Certain general characteristics of chemical attack on porcelain enamel are of interest in connection with both testing of surfaces and evaluating the cause of corrosion in a laundry unit. Solutions in contact with the porcelain enamel surface build up products of reaction at the interface which tend to reduce the rate of corrosion. The rate at which these films are removed is a part of the corrosion problem. These interface concentrations or films tend to be removed by agitation, causing movement of the solution over the surface, by movement of other materials such as cloth over the surface, and by boiling action in the solution.

# **Boiling** action used

### to accelerate tests

The boiling action is used to a great extent in testing of porcelain enamel, and it accelerates the corrosion by movement of solution as well as by the high temperature. Forced movement over the surface is used in certain types of test apparatus and is, of course, noted on surfaces in laundry units. It

should be noted that surfaces in a laundry unit which would outwardly appear to be in areas of movement of solution will build up deposits which will then be protective in nature. These deposits may be from soil picked up in the washing, including lint, or they may come from natural hardness in the water as well as from products of corrosion on the porcelain enamel surface.

Areas where clothing rubs over the surface are found in the laundry units. From a test standpoint, scrubbing of the surface of samples at regular intervals during the test tends to simulate the condition where clothes rub the surface in the laundry unit. The term "rub" is used to denote a condition which is more severe than one which might be described as tumbling.

# Water condensate areas in "closed circuit" dryers

Following the same line of thought in regard to the change in solution at the surface, the cause for attack in water condensate areas is revealed. This is encountered in closed circuit dryers. Water, condensing from a high humidity, relatively-high temperature atmosphere on a porcelain enamel sur-

ABOUT THE AUTHOR—E. E. Bryant received his education at Alfred University, where he graduated in 1931 with the degree of Bachelor of Science in Ceramic Engineering. After working for several years for the Lisk Manufacturing Company, Ltd., he joined Ferro Corporation of Cleveland in 1936 as Research Engineer. He became Director of Ceramic Research in 1942, Director of Enamel Development in 1949, and received his present post as Technical Director, Frit Division, Ferro Corporation, in 1951.

face which approaches the boiling point of water, is attacked due to the high temperature and the constant replenishing of the water which removes the film on the surface. Areas where the condensate forms on a cool surface, and areas which are not enough to avoid condensate, are not attacked. From a test standpoint, the attack proceeds at a rapid rate when the porcelain enamel surface is between 170 and 200°F, and the water is condensed from steam at 212°F or above.

# Abrasion alone is not the major cause of failure

In view of the foregoing discussion of chemical attack and removal of films, it is apparent that abrasion failure cannot be definitely separated from alkalic or hot water attack. That is, areas of greatest abrasion would also be areas of greatest attack chemically, since the surface film could be most completely removed in the area where load, plus movement, on the surface would be expected to the greatest degree. Soil and clothes rubbing over a surface will produce an abrading action.



MAY . 1957 MPM



ABRASION TESTER with retaining rings and test specimens in place. Unit was developed at National Bureau of Standards by Porcelain Enamel Institute.

The best opinion is that abrasion alone has very seldom been the major cause of failure. However, dependent upon the design, abrasion resistance must be considered to a greater or lesser extent; i.e., compare the possibilities in an inner tub with flights to the smooth surface of a spinner tub in an agitator unit.

The term "gouging" refers to damage which might be done by an item such as a very heavy belt buckle, which might leave individual marks, as opposed to the general wearing of the surface which is designated as abrasion. There is at present no satisfactory test which can be performed on sample plates to evaluate gouging resistance. Apparently coefficient of friction developed by use, and by atmosphere and contour of surface, all contribute to the susceptibility to gouging. Obviously, the design has much to do with the type of action which may be produced with an article such as a belt buckle. If it only slides on the porcelain enamel surface it will contribute to abrasion and will not gouge the surface.

# Characteristics of unit which influence corrosion

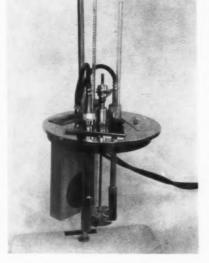
a) Alkali and hot water attack — Detergents vary greatly in their corrosive action on porcelain enamel. It would seem that some problems of alkali attack would be eliminated by the selection of detergents and the education of the user in improved detergents from a corrosion standpoint. It is encouraging to note that detergent manufacturers are showing interest in the corrosive nature of their product.

Alkali attack is rapidly accelerated

by increase in temperature. Therefore, units designed for higher temperatures will be more prone to attack. It must be recognized that higher temperatures greatly assist the removal of soil by detergent solutions, and the efficient washing cannot be sacrificed. However, attempts to set an upper limit on temperature would be helpful for machine life, and perhaps for the life of the fabric being laundered.

Acceleration of alkali corrosion due to rapid removal of surface films offers the best lead to reduction of corrosion by design. It is suggested that a concept of moving load per unit area and velocity form a good basis for design ideas. The loading produced by cloth dragging over a protruding surface must be given greatest consideration. Static load alone would be misleading. Such a concept would involve slope of flights, radius at inner edge of flights, length of flights, and centrifugal force. When there is no movement of the load on the surface, as in spin dry operations, the action of film removal is not encountered. One major question might be: Can efficient washing be produced by cloth rubbing on itself, and can this action be imparted without excessive rubbing over the surface of the unit?

b) Water condensate attack — As pointed out earlier, this attack occurs when water condenses on a surface which is at a relatively-high temperature. It is encountered in dryers, or in the drying cycle of combination units, and the problem predominates in "closed circuit" (internal condensing) units. One basic concept will avoid excessive attack. It may be assumed that a surface below 140°F is not attacked at a to Page 78 →



ALKALI TESTER (below) consists of electronic temperature controller, beaker for test solution, and insert. Center photo shows stirrer and accessory equipment.



MPM MAY . 1957

# **How Blackstone beat corrosion**

synthetic detergents almost proved fatal to automatic washer production until plastisol coating was adopted for drain casings

by Russell L. Carlson . PLANT SUPERINTENDENT, BLACKSTONE CORPORATION

AT the same time that Blackstone Corporation, the oldest home laundry manufacturer in the United States, was pioneering the making of mechanically-controlled automatic washers following World War II, another post-war development was also being pioneered, and was gaining an equally good reception from the housewife.

This was the development of synthetic detergents. These new materials, replacing soaps and providing fast-cleaning action, turned out to be rust catalysts in a big way when used as a washing agent in automatic machines which require an outer tank or drain casing for the water, in addition to the usual porcelain enameled or stainless steel washer tub.

The drain casing of an automatic cannot be reached for easy cleaning. The new detergents promoted the formation of rust very quickly in these washer tanks. Phosphatizing, galvanizing, and the usual primer-coat paints were ineffective; nothing worked.

# **Plasticity** required

The problem was to find a protective substance that would be plastic enough to find its way into the smallest corners of the tank and around the welded bottom seams. The finish had to have qualities of durability and resilience to withstand hard and long home use.

Manufacturers of plastic finishes were contacted, and our supplier sent technicians to our plant to survey the problem. It was suggested that a plastisol finish would provide all the prerequisites needed to protect the automatic washers against corrosion for more than their expected lifetime.

Soon the necessary spray booths, racks, and other equipment necessary for applying plastisol, were set up in the plant. Blackstone employees were



Primer coat is sprayed on automatic washer tank to a thickness of 1.5 mils.

trained to apply the material. Shortly, automatic washers with drain casings finished with plastisol were being shipped to distributors.

We had found the right answer. Detergent-induced corrosion was eliminated and, since the cost of using the plastisol process runs approximately the same as other anti-corrosive agents, the company did not have to adjust the price of the washer.

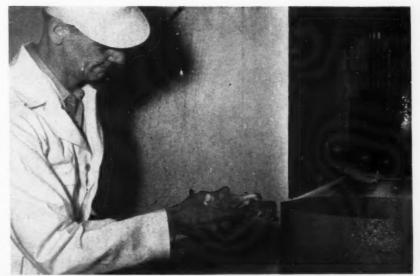
#### **Application** method

In applying a plastisol finish to washer drain casings, a primer coat is first sprayed on to a thickness of approximately 1.5 mils. After being allowed to air-dry for 30 minutes, the tanks are sprayed with a coat of plastisol. The units are then baked in an

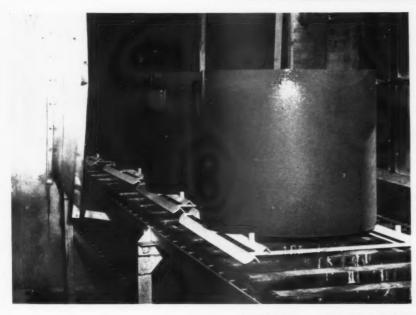
assembly line oven for 30 minutes at 375 degrees F.

The resulting finish is about 8-plus mils thick, and has a slightly resilient texture. The entire surface of the casing, inside and out, is in effect coated with a tough, waterproof film that affords 100-per cent protection against corrosive elements. We at Blackstone are especially pleased with plastisol because its penetrating action reaches every part of a metal surface that water will contact, such as pits and folds in welded seams.

The coating has been so satisfactory in use that the company is using the product on the Blackstone Model 350 automatic washer, and on two new washers which will appear on the market later this year.



After primer coat is air-dried for 30 minutes, a coat of plastisol is applied to tank prior to baking operation in oven shown in background.



The plastisol coating is baked for 30 minutes at 375 degrees F. in a convection-type oven. The resultant finish is approximately 8 mils thick, and is slightly resilient.

Tank is assembled in Blackstone automatic washer prior to installation of porcelain enameled washer tub.



PHOTOS COURTESY
THE STANLEY CHEMICAL CO.

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# PHILLIPS HEXAGON WASHER HEAD SCREWS

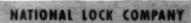
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# The electroplating of zinc die castings

rolled and die cast zinc, in its various basic designs and complex shapes, is taken through the electroplating process in this article

by Ernest Horvick . AMERICAN ZINC INSTITUTE, INC.

PART TWO

UNDER the jurisdiction of Committee B-8, the American Society for Testing Materials has adopted tentative specifications B142\* to provide coating thickness limits for nickel and chromium coating on zinc. Three types as listed below are included to cover the requirements of service conditions of different severities.

\* ASTM Standards, 1949, Part 2, page 754.

While satisfactory methods are available for the plating of nickel directly on zinc, the coatings produced from these special solutions cannot normally be applied in thicknesses exceeding about .0005", since the heavier coatings have a definite tendency to crack in service. Successful deposition of the heavy coatings required for outdoor service is accomplished by the use of

ordinary warm nickel solutions after first applying a protective strike coating in a thickness sufficient to prevent attack on the zinc die casting by the warm nickel bath. Two types of strike coating may be used: (1) nickel direct and (2) cyanide copper. Descriptions of the plating solutions and optimum operating conditions will be found in succeeding sections of this article.

The all-nickel type of heavy coating offers some advantages over the coppernickel system of plating but can only be applied to relatively simple shapes. The majority of zinc die castings are plated today by the copper-nickel system.

# | Thickness of Coating, In. | Type FZ | Type KZ | Type QZ | Type FZ | Type KZ | Type QZ | Type FZ | Type KZ | Type QZ | Type FZ | Type KZ | Type QZ | Type FZ | Type KZ | Type QZ | Type FZ | Type KZ | Type QZ | Type FZ | Type KZ | Type QZ | Type FZ | Type KZ | Type QZ | Type KZ | Type K

The specification states that by agreement between the manufacturer and the purchaser copper may be omitted in Types FZ and KZ provided the minimum nickel thickness is increased to the minimum total required for copper plus nickel. This alternative is also permitted in Type QZ without perior agreement. All minimum requirements apply to significant surfaces agreed upon by supplier and purchaser.

It is expected that additional heavier coating classifications may be needed for best performance under severe exposure conditions although no specifications covering such types have been published as yet.

#### Direct nickel plating

Too much attention cannot be given to the selection of a suitable minimum coating thickness for a particular type of service and the conduct of acceptance tests to insure that the desired coating is actually being applied.

The deposition of nickel on zinc from

# ELECTROPLATING CONTINUED

the ordinary warm soft nickel bath is normally not successful. This is due to the position occupied by zinc in the electrochemical series. When such plating is attempted zinc will dissolve in the recesses and will then co-plate with the nickel in the form of a black streaky deposit when a critical zinc concentration has been reached in the solution immediately adjacent to the surface. It is necessary, therefore, to adopt a nickel procedure for use on zinc that is somewhat different from that employed in nickel plating on brass and steel.

Satisfactory plating of nickel on zinc can be accomplished by the simple expedient of repressing the ionization of the nickel salts by the addition of sodium sulfate. The following solution has been used commercially for several years: nickel sulfate, 10-15 oz./gal. (75-112.5 grams per L.); anhydrous sodium sulfate, 10-15 oz./gal. (75-112.5 grams per L.); ammonium chloride, 2-3 oz./gal. (15-22.5 grams per L.); and boric acid, 2 oz./gal. (15 grams per L.).

Operating details for this solution are given below:

pH — The most desirable pH range varies with the nickel concentration. When the nickel sulfate is held at 10 ounces per gallon the pH should be

REFRIGERATOR HANDLES are carefully inspected before being conveyed to the plating line.



held between 5.3 and 5.7. When the nickel content is at the maximum the pH range should be lowered to 4.9 to 5.4. The anode area should be controlled to minimize the pH changes. The pH should be checked daily and adjusted as needed. Under the best operating conditions the solution will tend slowly to become alkaline. In solutions with the lower nickel content the pH may be adjusted by additions of ammonium hydroxide or sulfuric acid as needed. The 15-ounce per gallon solution is nearly saturated with respect to nickelammonium sulfate and the control of pH should be accomplished by means of additions of sodium hydroxide or hydrochloric acid.

Nickel content — The prescribed nickel sulfate range corresponds to from 2 to 3 ounces per gallon of nickel, calculated as metal. Any large increase above 3 ounces per gallon may result in the crystallization of double nickel salts from solution.

Sodium sulfate content — The amount of anhydrous sodium sulfate present in the solution should be regulated to suit the complexity of the articles to be plated. Simple shapes may require not more than 10 ounces per gallon of sodium sulfate but more complicated shapes may require the presence of 15 ounces per gallon or more. Many commercial platers add as high as 24 ounces per gallon. In general, the sodium sulfate content should be the lowest possible for the articles being plated, since the tendency towards cracking increases with increases in this constituent.

Temperature - In the past this type of solution has been operated at or preferably slightly above room temperature, that is, in the range of 70 to 80°F. (21 to 27°C.), when held at the low limit of nickel content. At the high limit of nickel content, higher temperatures are required and the normal range has in the past been 75 to 87°F. (24 to 30°C.). In recent years there has been a tendency to increase the temperature of operation in order to obtain greater operating speeds at higher current densities. The general range in commercial practice is of the order of 80 to 90°F. (27 to 32°C.)

Current density — When made up according to the formula given and used at room temperature, the bath should be operated between 12 and 20 amperes per square foot at the lower nickel concentration and between 24 and 36 amperes per square foot at the high nickel concentration. With the increase in temperature of operation employed by some commercial plants, small increases in current density have become possible.

The maximum current density will be determined by the tendency for the deposits to burn. If streaking occurs at the maximum current density, purification of the solution may be necessary.

Agitation — Agitation reduces porosity and permits the use of somewhat higher current densities. With certain shapes agitation will be found necessary for successful plating. In commercial practice the work is moved at speeds from 6 to 16 feet per minute.

Pitting — Pitting in this type of solution is frequently overcome by additions of oxidizing agents such as hydrogen peroxide or sodium perborate. Care should be taken to avoid adding an excess of peroxide since the increased cathode polarization resulting will cause the plate to become black and brittle. This effect is often confused with those resulting from excessive zinc contamination and high pH.

Carbonates — Carbonates have a strong tendency to promote brittleness in coatings produced in this type of solution.\* Air agitation should be avoided for this reason and any carbonates introduced in the process of removing excess zinc from the solution should be eliminated before placing the bath in production.

Thickness of coating—The thickness of coating deposited by the direct nickel method will depend to a considerable extent on whether it is being used as a sole coating or as a strike coating. In the latter case the thickness should be restricted to the thinnest coating which will give adequate protection in the recesses of the surface when placed in the warm nickel bath. The maximum thickness should not exceed about .0002" and preferably should be of the order of .0001".

Where the coating is being used either alone or with a chromium finish coat, the minimum thickness at the thinnest point on significant surfaces should not be less than .0003" where reasonable protection in service is desired. On the other hand, thicknesses greater than .0005" should be avoided since cracking of the deposit may result.

# Direct copper plating

As stated earlier, practically all plating of zinc die castings is now being done by a system of strike coating with copper followed by the deposition of a heavy, soft nickel layer.

In this system of plating, the work is cleaned substantially as described in the earlier sections of this article. A coating of copper is applied from a copper cyanide solution, following which the remainder of the coating is built up in a warm nickel bath. The cyanide copper solution most commonly used is that containing Rochelle salts. The composition varies somewhat from plant to plant, but the following formula is typical:\*

\*E. A. Anderson – Trans. American Electroplaters' Society, 1936

	cyanide 3.5 cyanide 4.6			
	carbonate 4			
Rochelle	salt (	oz./gal.	(45	grams/L.)

As commercially used the composition falls in the following range:

Copper.			 	1.8-	3.5 oz./gal.
					1.5 oz./gal.
Sodium o	arbor	ate	 	2 to max	. 8 oz./gal.
Rochelle	Salt.		 		2-5 oz./gal.
ph			 	1	11.5 to 12.5

Blum and Hogaboom, Principles of Electroplating and Electroforming, McGraw-Hill, 3rd Edition, 1949, p. 297.

This type of solution is operated commercially in the range 120 to 180°F. (49 to 82°C.) with the narrower range of 130 to 140°F. (54 to 60°C.) receiving the greater preference. The current density used ranges from 20 to 50 amperes per square foot but most plants operate in the narrow range 20 to 35 amperes per square foot.

Some plants continue to use the sodium cyanide-copper solution with no Rochelle salt addition. A typical formula for this type of bath follows:

Copper	cyanide		0	0		0	0	0	0	0			. 4	oz./gal.
Sodium	cyanide .				0								5.4	oz./gal.
Sodium	carbonate									0			2-4	oz./gal.

This solution when made up should contain about 3 ounces of copper metal and about 1 ounce of free cyanide. It is normally operated at 110 to 140°F. (43 to 63°C.) at 10 to 20 amperes per square foot.

Agitation — Many plants have found it advisable to agitate the work while copper plating. Cathode rod agitators moving from 6 to 16 feet per minute are commonly used. In the laboratory a tendency for gas ridging has been overcome by agitating work. Many plants operate conveyorized equipment which supplies the desired motion.

pH — In recent years attention has been called to the possible influence of pH variations on the deposition of copper and other metals from alkaline solutions. Reference may be made to a study of the Rochelle copper solution by Messrs. Graham and Read.\*

Proprietary solutions developed by two eastern companies\* are widely used. Both are capable of producing brighter copper deposits at higher speeds than those described above.

in general, where bright nickel plating is used over copper, every effort should be made to produce as smooth



CHROMIUM PLATING of zinc die castings is being done in this photo. The panel piece is part of a Maytag washer. At this stage, it is copper plated and ready for the nickel bath.

and uniform copper deposits as possible. Each plater must work out a suitable procedure for his own work.

The following comments may be made on the copper plating of zinc:

Thickness of coating — The coppernickel system of plating is adapted to the production of heavy deposits. Its use is not advocated for coatings less than .0005" in total thickness. The copper layer must be sufficiently thick to prevent complete absorption of the copper in the zinc alloy base and to provide adequate protection of the zinc from attack by the warm nickel solution. The thicknesses given in Section V should be observed.

Blistering — Cyanide solutions, particularly when used in plating on zinc, may at times produce deposits which blister readily. While much study has been made of this problem, all of the variables contributing to this type of blistering have not yet been evaluated. It seems clear, however, that faulty cleaning, particularly overcleaning, is one of the more common causes.

 A. Kenneth Graham & Harold J. Read — Metal Industry starting Feb., 1938
 Names furnished on request Absorption—Unalloyed zinc absorbs copper deposits, even at room temperature. Thin flash deposits are absorbed very rapidly. The rate of absorption in zinc die castings is substantially lower than in rolled zinc. It is not expected that deposits .0002" in thickness will be completely absorbed during the normal lifetime of a plated part made of either material when used at ordinary temperatures.

# Treatments prior to final plating

Following the production of an adequate strike coating of either direct nickel or copper, it is possible to proceed with the building up of the coating to the desired thickness by the ordinary warm nickel procedures. Certain precautions are necessary, however, in transferring the work from the strike operation to the final plating operation.

IN JUNE 3



# ARMCO'S DADISMAN TO SERVE ON TRADE MISSION

Armco Steel Corporation's director of market development, R. A. Dadisman, has been selected by the U.S. De-



partment of Commerce to take part in a special six week government t r a d e mission to Italy.

Aimed at promoting increased twoway trade and good will between the U.S. and Italy, the

mission will be made up of four prominent American businessmen who are donating their time to the government. A Department of Commerce official will lead the group. Dadisman will serve as a specialist in the fields of distribution and market research.

While in Italy, he will deliver a special address on modern porcelain enameled curtain wall construction to a combined group of Italian architects and porcelain enamelers.

# LOS ANGELES DEALERS AIR-TRAVEL TO AIRTEMP

Twenty-eight cooling and heating men representing the greater Los Angeles area have completed a two-day visit to the Airtemp plant, Dayton, Ohio.

The group became the largest West Coast Airtemp distributor-dealer contingent ever to make a jaunt from California to the Dayton factory.

Headed by Glenn A. Ashburn, president of Ashburn Supply Co., Culver City Airtemp distributor and trip sponsor, the party included twenty dealers, seven Ashburn representatives, and E. D. Dickson, Airtemp West Coast regional manager.

Traveling by chartered plane, the group arrived March 14 and departed on the 17th. Following a welcome by C. E. Buchholzer, Airtemp president, the party spent Friday, March 15th inspecting the company's engineering laboratory and production facilities. In the evening, they were guests at a cocktail party and dinner in their honor at the Dayton Biltmore hotel.

Saturday, they attended a special conference conducted by Airtemp sales and merchandising officials.

# FEBRUARY VACUUM CLEANER SALES TOP PRECEDING MONTH

February sales of 300,887 standardsize household vacuum cleaners were the second largest for that month in the industry's history, exceeded only by 311,448 units in February, 1948, after a scarcity of vacuum cleaners during the war period.

February sales were 5.1 per cent greater than 286,386 cleaners in February, 1956, and topped 276,738 units in January, 1957, by 8.7 per cent, according to figures for the industry announced recently by the Vacuum Cleaner Manufacturers' Association.

# RYAN AERONAUTICAL BUILDS NEW RESEARCH BUILDING

Ryan Aeronautical Co., Los Angeles, has started construction of a new \$500,-000 engineering and laboratories building to house expanded research and development facilities and engineering offices. The company's underroof facilities will pass the million square-foot mark on completion of the new two-story, 340-foot long structure.

# JOHN WOOD CO. ACQUIRES RESEARCH SITE IN NEW JERSEY

John Wood Co., manufacturer of steel products, has just purchased a 16-acre tract of undeveloped land on Hanover Road, Florham Park, N. J., for future expansion of its Engineering and Research division, Guy George Gabrielson, chairman of the board, announced.

Gabrielson reports that the new site will be available for other corporate purposes as needed by the company. No date has been set for construction of the new Research and Engineering facilities; however, preliminary aproval has been secured for the project from the Florham Park Planning Board.

# AMERICAN LITHIUM INSTITUTE LAUNCHES RESEARCH PROGRAM

The American Lithium Institute has initiated a program of sponsored research on lithium alloys at Massachusetts Institute of Technology. The Institute will also establish fellowships.

The announcement of research projects and fellowships was made by Marshall Sittig, president and managing director of the newly-formed Institute, at a press conference in New York City.

At MIT, under a grant-in-aid, Professor Michael B. Bever of the Department of Metallurgy will supervise a fundamental study of lithium alloys. The purpose of this work is to broaden basic information on known lithium alloys, and to develop data on unknown lithium alloy systems needed in evaluating their potentialities as new materials of construction. Professor Bever will be assisted in the project by a full-time associate and the graduate student who will receive the A.L.I. fellowship.



Marshall Sittig, president and managing director of the American Lithium Institute, Inc. Sittig, shown here with a rough dummy of a booklet on lithium, has announced the first Institute-sponsored research projects. One is at MIT on lithium alloys.

# ADMIRAL MOVES TO 2nd PLACE IN FREEZERS

Admiral Corporation's spectacular growth in the appliance industry in less than 10 years parallels the company's earlier growth in the radiotelevision industry.

Speaking at the annual banquet of the manufacturer's section of the Galesburg Chamber of Commerce, Martin Sheridan, Admiral's director of public relations, pointed out that the Chicago company currently is the second largest producer of freezers in the United States and the fifth largest manufacturer of refrigerators.

Between 1939 and 1941, he said, Admiral moved from 52nd to 4th place in the radio industry. Similarly in 1949, coming from practically nowhere, the company moved to first place in the television field.

Sheridan said that Admiral's Appliance City in Galesburg now has 1,000,000 square feet of floor space. Established in 1950, it is the largest of the company's plants as well as the largest manufacturing facility in Galesburg. Production capacity is over 500,000 major appliances a year. Over 5,500 carloads of finished products were shipped from Appliance City in 1956 to all parts of North America and to over 70 countries throughout the world.

# ALLMETAL AWARDS ANNOUNCED

Complete entry details for the Allmetal \$1,500 awards are now available. Top prize of \$1,000 will be awarded for the case history that describes the most interesting use of stainless steel fasteners in product manufacturing.

If your firm manufacturers a product that contains stainless steel screws, nuts, bolts, washers, or rivets, etc., you may win one of the prizes. The contest is open to any person employed by a product manufacturer, including personnel in engineering, production, purchasing, and management.

Write to: Allmetal Screw Products Co., Inc., 821 Stewart Ave., Garden City, L.I., New York.

# **NEW ARI BOOKLET**

A sixteen-page booklet, "Everybody Talks About the Weather—Now Look What You Can DO About It", was issued this week by the Room Air-Conditioner Section of the Air-Conditioning and Refrigeration Institute for general distribution.

Published with the aim of providing brief, accurate information on room air-conditioners, the booklet is written in question-and-answer form and covers the benefits of air-conditioning generally, advantages of room units, sizes and capacities available, how to estimate the size needed, and other information.

The booklet urges prospective buyers to seek the advice of reputable dealers on the capability of a unit "to do the job you want done."

It is expected that the booklet will be made available by manufacturer-members of ARI through their dealers and

# CONFIDENCE SEEN IN \$18 BILLION OUTLAY FOR HOME FIX-UPS

The "incredibly-huge totals" Americans are spending to improve their homes is dramatic proof of a new high level in consumer confidence, according to Harold Massey, managing director of the Gas Appliance Manufacturers Association. "Families are estimated to have spent \$15 billion last year expanding and remodeling their homes, and the 1957 figure is put at \$18 billion," he noted. "They're spending it in long-lived items such as building, plumbing, appliances, and equipment. In many respects it's a better indicator of confidence than some others more widely

used. The number of new house starts, for example, is tied up with matters of money markets, land availability, and family formation. Industrial expansion is dictated in part by technical changes and competitive demands."

Massey said that still further step-ups in appliance dealer demonstration programs are necessary in the expanded market. Toward this end, he said, gas appliance manufacturers have instituted college-industry-sponsored sales courses. Actual product demonstrations, he said, are being stressed to help dealers "clinch" the story told by advertising.

# MAYTAG VP HONORED FOR 40 YEARS SERVICE



Roy A. Bradt, vice-president in charge of marketing for The Maytag Co., was honored with a diamond-studded pin in recognition of his recent completion of 40 years continuous service to the company. The presentation was made by Fred Maytag III, president, at the annual meeting of the

Maytag Twenty-Five Year club. That organization now has 345 members, representing a total of 10,966 years of service to the Maytag company. Pictured from left are Jess Young, Maytag regional manager at Great Falls, Mont.; Bradt; Maytag and Sam J Saad, Chicago regional manager.

distributors. Single copies are obtainable at 10c from Air-Conditioning and Refrigeration Institute, 1346 Connecticut Avenue, NW, Washington 6, D.C.

# FOUR COMPANIES FORM UNITED MANUFACTURERS

Four manufacturers of commercial kitchen machinery have combined to provide a joint coast-to-coast sales, warehousing, and service policy on their full lines of equipment, it was announced today by Homer F. Lyman, president of the Universal Dishwashing Machinery Co., one of the four firms.

The plan will provide a single source of supply and service for such highly specialized kitchen machines as commercial type dish, glass, and silver washers; scales, slicers, choppers, and saws; vertical and horizontal mixers, and vegetable peelers.

Members of the group, as presently organized, include Universal Dishwashing Machinery Co., Nutley, N. J.; Sanitary Scale Co., Belvidere, Ill.; Triumph Manufacturing Co., Cincinnati, Ohio; and M.J.M. Manufacturing Co., Culver City, Calif.

These four manufacturers will maintain separate manufacturing facilities at their present locations. Joint warehouse and service centers will be set up to provide single-source buying.

# FORECASTS WESTINGHOUSE SALES OF TWO BILLION IN 1957

Gwilym A. Price, chairman and president of Westinghouse Electric Corp., forecast sales billed in 1957 by Westinghouse would approach a record two billion dollars on the basis of high backlogs of orders for apparatus and industrial products, growing defense business, and the company's position in atomic power. At the same time, he predicted that earnings per share this year would be between \$3.50 and \$4. Price made his predictions at the 71st annual stockholders' meeting in Baltimore, Md., April 3.

"This forecast," he explained, "is based on anticipated earnings per share averaging about 25 cents for each month in the first half of the year, and 40 cents per share per month in the second half. For the first two months our earnings were equivalent to 25 cents per share for January, and 26 cents per share for February."

The meeting, which was held in a huge airplane hangar at the company's Airport Plant near Friendship International Airport, was attended by more than 1000 stockholders and guests who came from 20 states and the District of Columbia.

# GAS FURNACE HOLDS 'CHAMP' TITLE IN U. S. HOME HEATING

The gas-fired warm air furnace not only is holding but is extending its margin of victory in the race for favor in the home heating market, says the Gas Appliance Manufacturers Association.

In 1956 alone 808,000 of these furnaces were shipped by manufacturers—a total far above that for any other item of central heating equipment, and second only to the gas furnace record in 1955, when the number of housing starts was larger.

The gas furnace total includes some gravity-type units, but by far the largest number are of the forced warm air type. In a forced warm air system, a blower is used to circulate humidified, filtered air through a system or ducts, and to draw back cool air from various rooms for reheating. This reheated air is mixed with other air to provide a constant fresh supply.

# U. S. STEEL RELEASES 1957 "KITCHEN CALL" SERVICE KIT

All daily newspapers are receiving copies of U. S. Steel's newspaper service kit for the corporation's 1957 "Kitchen Call" promotion.

The kit illustrates the 1000-line U. S. Steel "Kitchen Call" ad which will appear in some 200 newspapers in "U. S. Steel Hour" television market areas. The insertion order permits papers to run the ad any time between May 8 and May 22, the dates of the promotion's TV commercials.

The kit includes both editorial and advertising ideas. Kitchen modernization and kitchen planning features are balanced by prepared ads for local tie-in by appliance dealers, distributors,

The kit features a gas page endorsed by the American Gas Association, and an electric page endorsed by Live Better Electrically, Ads are for potential use by gas, electric, or combination utilities. Mats of these ads are included in the package.

# BORG-WARNER TO BOOST PLANT, EQUIPMENT FACILITIES

Borg-Warner Corp. plans to invest approximately \$26,000,000 in new plants and modern equipment this year. Roy C. Ingersoll, chairman of the board announced

This total, one of the largest annual appropriations in company history, will boost to nearly \$186,000,000 the amount of capital expenditures made by



Here's how one manufacturer took full advantage of our complete fabrication facilities to obtain an unusually beautiful drawer pull. It performs three important functions . . . pulls the drawer . . . identifies the contents . . . has lasting beauty. And it looks much more expensive than it costs.

Whether you manufacture refrigerators, ranges, air conditioners, or any other product; whether you've been using aluminum extrusions, or whether you haven't; it will pay you to investigate the possibilities provided by our complete extruding, fabricating and anodizing service.

We're happy to be of any service that will save you time, money, or both. Our design engineers would like to work with you on any problem, to pool their "can-do" knowledge of aluminum extrusion procedures and possibilities, with your "know-how" of manufacturing.

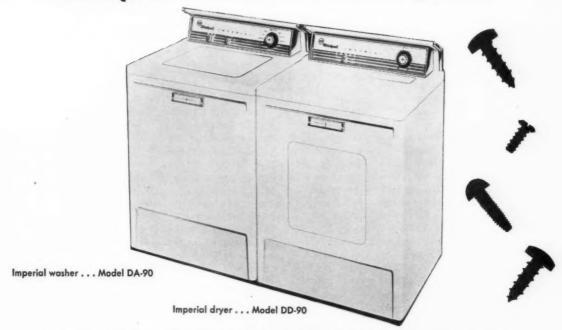


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Keeping production lines operating smoothly and efficiently is an exacting job that requires careful, intelligent planning and purchasing. We're pleased that Whirlpool-Seeger Corp., like other leading manufacturers of home appliances, uses Universal Screws in their assembly operations . . . pleased that Universal quality, dependability, and low costs have become an accepted fact in the home appliance field. If you have not yet experienced the plus factors that buying screws from Universal provides there's no better time than now to take advantage of them . . . to put Universal know-how and service to work for you.





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the company since World War II. The 1957 figure is only slightly under last year's \$27,300,000.

The largest single disbursement, totalling about \$6,500,000, will be spent to complete the new \$10,000,000 chemical plant of the corporation's Marbon Chemical division in Washington, W. Va. This project is being built on a 322-acre Ohio River-front site, and will go into production this spring. It will manufacture a hard, tough plastic called Cycolac.

Another \$5,000,000 to 6,000,000 has been earmarked for additions and improvements to Borg-Warner facilities in the Chicago area. Among these are the new Research Center in Des Plaines, Ill., and the various plants operated by the Ingersoll Products, Spring, Borg & Beck, and Calumet Steel divisions.

The balance of the funds will provide for sizable allocations to the York, Norge, Warner Gear, and Byron Jackson divisions, and for a proposed new factory for the Warner Automotive Parts division at Auburn, Ind.

"Our sizable capital expenditures for 1957 re-affirm Borg-Warner's confidence in the stability of the country's economy, and are based on conservatively calculated appraisals of the company's growing sales potential during the year," Ingersoll said.

# AHLMA REPORTS APPLIANCE FACTORY SALES

Total domestic factory sales of home laundry appliances for February, 1957, amounted to 458,235 units, an 8 per cent decrease from January, and 18 per cent less than February, 1956, Guenther Baumgart, executive director of the American Home Laundry Manufacturers' Association, announced. Unit sales for the first two months of 1957 were 15 per cent below the corresponding 1956 period.

# LEWYT ANNOUNCES PERSONNEL CHANGE

A change in the sales and marketing executive office of the Lewyt Corp., vacuum cleaner manufacturers, was announced recently by Alex Lewyt, president at a meeting of national district managers in the company's Long Island City plant.

Walter J. Daily, who has been vicepresident in charge of sales and merchandising since the Lewyt cleaner was introduced in 1947, is relinquishing his post to become assistant to the president. He will continue as a vice-president of the company. However, he will work on a part-time basis, for his new duties are in effect a step toward retirement. He will serve as consultant to the management committee, and his counsel will be available to the markering departments.

It was pointed out that Lewyt is now involved as the head of three different corporations, making electronic equipment, air conditioners, and vacuum cleaners, and Daily's experience should be valuable in relieving the chief executive in top level duties.

# **DESIGN FOR TOMORROW'S LIVING**

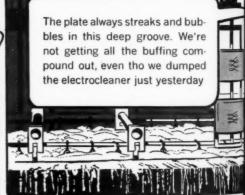
Homes that roll off the production lines with the efficiencies of the "pushbutton age" we have dreamed about for years are now a possibility. Our children may be buying them for their honeymoon homes.

These will not be pre-fabricated homes as we now know them. They will be developed to lower the cost of the entire home unit (house, furniture, appliances, heating, and laundry equipment) by taking advantage of mass production techniques that have given Americans the highest standard of living the world has ever known.

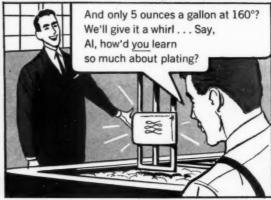
This far-reaching view was expressed at a symposium, "Design For Tomorrow's Living," sponsored by the American Society of Industrial Designers held in the Prudential Bldg., Chicago, March 25th.

The panel was made up of some of









"To work for Pennsalt, I had to learn not only your problems but the problems of the drawing shop, the paint shop, the porcelain enamel boys, the aluminum fabricators — everybody who uses chemicals on metal."

the nation's leading industrial designers, an architect, a food expert, and specialists reporting the field of home living.

Designer Paul McCobb, New York, said: "Twenty years from now prefabricated housing will be the biggest industry in this country. The first of these homes will be like a model "T" compared to today's automobile. Eventual refinements will offer us automatic windows, built-in furniture, and more space than we enjoy in today's home. This can be accomplished as soon as the builder, or whoever holds the mortgage, wants to do it."

Asked what prerogative male designers have for planning homes and appliances for women, the panel said its future planning was based on thorough studies of what the homemaker wanted to satisfy her emotional needs and the desires of her family.

"Manufacturers are missing the boat with today's appliances," said Franz Wagner, vice president, Raymond Lowey, Inc. "The kitchen can have as much excitement for the owner as an automobile. This is the hearth—the center of the home. To our new appliances we must add the kind of 'fun' that evokes pride in the preparation and sharing of a meal."

There was continued emphasis on the kitchen as the focal point of the American family. Dr. William Bradley, scientific and research director of the American Institute of Baking, said he did not believe that pills will ever replace meals. "However, the demand for convenience will lead the American housewife to employ an ever greater amount of precooked meals heated in a jiffy in electronic ovens, leaving gourmet meals to occasional preparation. Much of this special cooking will be done by the men."

In summing up, moderator Dave Chapman, Chicago industrial designer, said the professional designer's prime responsibility was to the consumer rather than the client. "We do not arrive at tomorrow's designs through crystal ball gazing," he said, "but through an honest attempt to satisfy people's basic needs and desires. The danger which designers must fight against is monotony and sterility in products which must remain humanistic despite the inroads of the automatic production line."

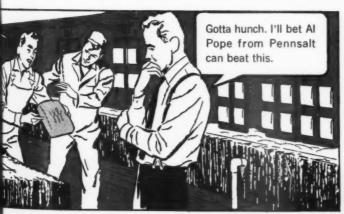
# NEW INDUSTRIAL DESIGN, ENGINEERING FIRM FORMED

A new company, Harper Landell & Associates, which includes the entire staff of the late Harold Van Doren, has been formed for the practice of industrial design and human engineering. This group headed by Landell will maintain offices, design studios, and model shop at 1717 Sansom St., Philadelphia, Pa.

Among the products on which this group has worked are: refrigerators, ranges, home laundry, air conditioners, freezers for Philco Corporation; television broadcasting equipment, computors, airborne radar and Signal Corps equipment for Philco Government and Industrial Divisions; ladies' shaver for Schick; packaging for Zippo; recorders for Fielden Division, Robertshaw-Fulton; bowling alley equipment for Sjostrom; toasters, irons for Proctor Electric; checkwriter for Safeguard; chain saw for Disston; resistance box for I.R.C., and many others.

Landell has been in the Industrial Design field for 20 years, having worked for the rail car engineering division of the E. G. Budd Co. Ketterlinus Lithographers, General Motors Styling Division, Oldsmobile Studio, and was staff designer for Carrier Corp. He is a member of the American Society of Industrial Designers and, for the past ten years, was associated with the late Harold Van Doren.

more news on Page 70



I think we can get these shells perfectly clean...and save you money besides, by letting you run your tanks cooler. I'll check our Whitemarsh lab.



Al, your service is as good as your products. We weren't getting anywhere with that buffing gook till I let Pennsalt work on it.

Remember — nobody knows more about metal processing chemistry than Pennsalt. Even if your trouble may not seem to involve your Pennsalt salesman, call him in anyway. Or write

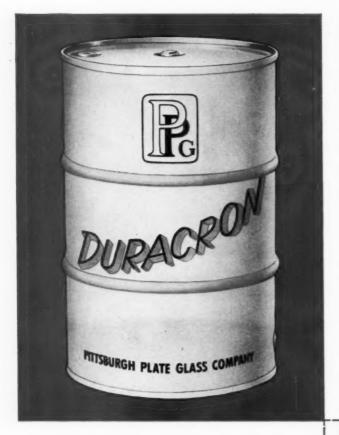
Metal Processing Dept. 481 Pennsalt Chemicals 3 Penn Center Phila. 2, Pa.	Pennsalt Chemicals
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- It has superior adhesion to bare metal or primer. It is remarkably tough and durable either as a one-coat enamel or over primer. It retains color and gloss for prolonged periods at temperatures up to 400°F. DURACRON also provides greater resistance to detergents, will not show stains from grease, fruits, mustard, etc. It withstands effects of salt spray, humidity and other corrosive atmosphere. In short, it's a sanitary, taste-free, marproof liner for food cabinets.
- New DURACRON can also be used advantageously on many other products to improve performance of enamels now used. We'll gladly provide you with additional information. Mail coupon below to Pittsburgh Plate Glass Company, Industrial Finishes Division, 1 Gateway Center, Pittsburgh, Pa.

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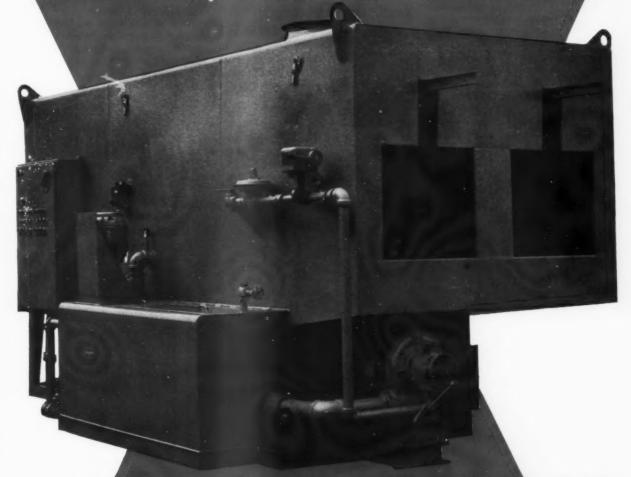
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Company
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# ING OP o-Pass Power Spray Washer by PETERS-DALTON



The installation above is of a gas heated 2-Pass Power Spray Washer, designed, engineered and built by Peters-Dalton, to simultaneously accept two conveyor lines of lawn and leaf rakes. This is part of a complete P-D system. After the cleaning operations, rakes continue on their separate lines to and through dip tanks, in which each line receives a different colored paint coating. The complete P-D installation includes the 2-Pass Gas Heated Power Spray Washer, with room temperature blow-off, nopies, dip tanks and drain enclosures. exhaust /

Saving effected here are obvious — not only does the washer conserve valuable plant floor since but, through the handling of two lines of parts, reduces by 50 per cent time that otherwise would be consumed in painting in separate colors.

Whatever your problems may be, you can depend, without any doubts, on the ability, service, quality and cost savings offered you by Peters-Dalton. More than a quarter century of designing, engineering pranufacturing and installing finishing equipment, of all types and sizes, assures you of finding the band most economical way to meet your needs. Just write, wire or phone — we'll be glad to tell you more

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- Pr Hydro-Whirl Paint Spray Booths
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- Pn Drying and Baking Ovens
- Pn Hydro-Whirl Dust Collecting Systems



### INDUSTRY NEWS

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## AIR POWER DEVICES FEATURED AT PMI CHICAGO DISTRICT MEETING

The Pressed Metal Institute meeting, held at Nielsen's restaurant, Elmwood Park, Ill., March 28, had as its theme the use of controlled air power devices in industry.

Emphasis was laid on the use of controlled air power on automatic drilling and tapping units, rotary and transfeed mechanism, work holding and ejection devices, and marking, piercing, and forming of parts in metal fabrication operations. A film, showing actual plant operations, covered many and varied uses of air power. Small but powerful air cylinders, coupled with hydraulic systems, were instrumental in increasing production, lessening operator fatigue, and promoting safety in plants across the country. Air units lend themselves to application on special purpose machines, and their versatility is virtually endless.

Speakers declared that industry competition, keener today than ever before, faces the problem of stepping up production with, in the case of small plants, present equipment, and controlled air power devices help solve the problem of modernizing existing equipment. At the same time, operation of machines equipped with these units approaches more nearly automation of machines which perform related or successive operations simultaneously. Used individually, or in combination, they can reduce direct labor costs, and increase machine tool efficiency.

Bruce Krasberg, PMI president, presented 1956 Safety Awards to the following: Mr. Vatet, Indiana Pressed Steel Co.; Mr. Smith, Suburban Metalcraft, Inc.; Mr. Jewett, Steel Fabricating & Engineering Co.; and Mr. Miller, Telmore Tool & Stamping Co.

District Chairman Awards were presented by Krasberg to: A. B. Anderson, Nagel-Chase Manufacturing Co., 1945-'46; Charles F. Elms, Elms Engineering Works, 1946-'47: Warren Peterson, Sr., Peterson Products Corp., 1947-'48, (given in absentia to Warren Peterson, Jr., for Mr. Peterson, Sr., now deceased); Clem Caditz, Northern Metal Products, 1949-'52; Tom Roberts, Kobzy Tool Co., 1952-'53; Mel Blume, Wisconsin Tool & Die Co., 1953-'56; and Warren Peterson, Jr., Peterson Products Corp., present chairman, Chicago district. New members of PMI announced during the meeting, are Miles

Irmis, Superior Tool & Stamping, and William Raisch, Reflector Hardware Corp.

Following dinner, discussion groups, headed by technical men from The Bellows Co., Akron, Ohio, whose equipment was on display, viewed the various types of air devices and their applications.

## AMERICAN WELDING SOCIETY NAMES SANDER PRESIDENT

New officers of the American Welding Society for the 1957-58 fiscal year were elected and introduced to the Society's membership at the opening session of the Aws Adams National Meeting, Monday, April 8, in Philadelphia. Installation of the newly-elected officers will take place June 1, 1957.

The meeting was held in conjunction with the Fifth Welding Show held at Convention Hall. More than 100 companies participated in the show.

New president of the Society is Clarence P. Sander, Los Angeles, Calif. Sander is general superintendent, Vernon plant, Consolidated Western Steel Div., United States Steel Corp. He previously served as first vice president of the Society.

Other new officers are: first vicepresident, Gustav O. Hoglund, Head, Welding Section, Alcoa Process Development Laboratory, New Kensington, Pa.; second vice-president, Charles I. MacGuffie, Manager of Marketing, Welding Dept., General Electric Co., York, Pa.; and treasurer, Harry E. Rockefeller, Manager, Electric Welding, Linde Air Products Co., New York, N. Y.

## LIVING LABORATORY SCHOOL ADVANCES CLASSROOM RESEARCH

A beautiful two-classroom school building has been dedicated to the research of better classroom climate.

Built by Lennox Industries, Inc., and equipped with the new Comfort Curtain heating and ventilating system, the "Living Laboratory" will house classes from the Altoona, Iowa, Consolidated School District.

The classes assigned to the Living Laboratory for various periods upon request of the heating and air conditioning engineers, will give the engineers an opportunity to conduct clinical research literally in their own backyard, since the school has been built adjacent to the manufacturer's Des Moines plant.

According to John W. Norris, Len-

nox president, the Comfort Curtain equipment will heat and ventilate schoolrooms in a manner that comes closer to the ideal system than any product introduced by the industry prior to this time. And, he adds, it will do this job at a savings of from \$800 to \$1200 per class room over the cost of central heating and unit-ventilator systems.

The Comfort Curtain consists of a residential-type forced air furnace combined with a new air-handling development that mixes just the right amount of outdoor air with the recirculated air in the room.

With this system, outside air is introduced into the classrooms at all times, but in varying quantities—the amount of outside air and the amount of heated air being accurately controlled so that the room temperature is always well within one degree of the thermostat setting.

### **INDUSTRY PERSONALS**

William W. Wallace, general manager of the International division of Servel, Inc., has been elected a vice president of the company. He will continue to be in charge of the division.

Edgar E. Donaldson has been appointed appliance sales manager of Perfection Industries, division of Hupp Corp. He was previously engaged in establishing wholesale outlets in Florida as district manager.

Ralph W. Freeman has been named plant manager for plants 1 and 2 in Cleveland for Iron Fireman Mfg. Co. He was formerly production manager.

Robert J. Pierson has been promoted to the newly-created position of plumbing sales manager of the home products division of Rheem Manufacturing Co., Chicago. The announcement was made by Andrew F. Cassidy, national manager of marketing for home products.

John E. Montgomery, formerly chief tool engineer at Solar Aircraft's Des Moines, Iowa plant, has been named general manager of Sheaffer's Tool & Die plant, Fort Madison, Iowa, a division of the W. A. Sheaffer Pen Co. He succeeds A. A. Zuber, who was elected a vice president in charge of manufacturing and engineering for the pen company.

Richard S. Sheetz, formerly with Westinghouse Elecrtic Corp., Mansfield Ohio, has been named manager of the company's water cooler and dehumidifier department, with headquarters in East Springfield, Mass. He succeeds E. P. Hartley, who resigned.

Forrest J. Hiday has been appointed director of manufacturing, American Kitchens division, AVCO Manufacturing Corp., it was announced by Curry W. Stoup, AVCO vice president, and general manager of American Kitchens. Hiday will be responsible for all production and manufacturing operations in his new position.





Appointments of Gerald L. Hartman and Karl R. Hake to new positions as product managers for RCA-Whirlpool and Estate ranges of Whirlpool-Seeger Corp., were announced recently by Sol Goldin, range division general manager. Hartman has been appointed product manager of gas ranges, built-in ranges, and electronic ranges. Hake has been promoted to product manager of electric ranges.







Promotions of Dale Graham and John P. Engelhardt to new positions as product managers, and appointment of Neil Forbes as product coordinator for RCA-Whirlpool home laundry appliances of Whirlpool-Seeger Corp., were announced by C. E. Morgenstern, laundry division merchandise manager.

William V. Crowley has been named sales manager for the Western division of ALWAC Corp., manufacturers of electronic digital computers and data processing systems, according to an announcement by A. Y. Baker, executive vice president of the firm.

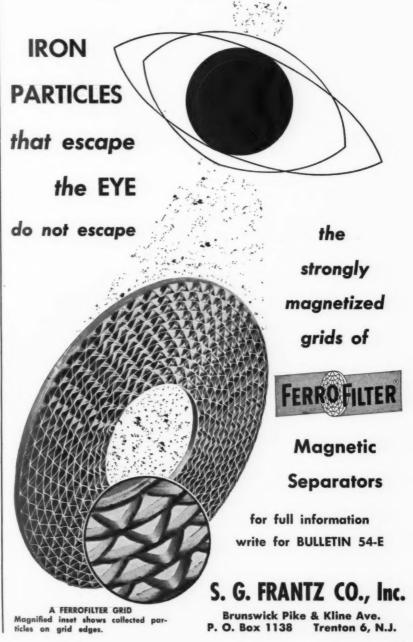
Robert C. Thompson has been promoted to the newly-created position of superintendent of finishing at The Maytag Company's plant 2, Newton, Iowa. He has been superintendent of porcelain finishing at the plant since it opened in 1949, and will be responsible for the supervision of both the porcelain and paint departments.

Simultaneously, Julian Silverberg has been promoted to senior welding engineer for Maytag. He formerly served as a tool design engineer.

Charles Moen, also promoted, is now junior service supervisor in the company's service department.

Bill Galloway and James Hertig, being the first employees to complete Maytag's engineering and manufacturing training program since its revision this year, have been named industrial engineers in incentives.

Carl L. Bobzin recently began work as a senior tool design engineer. Beture joining Maytag, he spent 21 years as a tool engineer at Midwest Metal Stamping Co., Kellogg, Iowa.



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### CONTROLS COMPANY SALES UP

Sales of Controls Co. of America increased 15 per cent, and earnings rose 14 per cent in 1956, as compared with performance of its predecessor companies in 1955, Louis Putze, president, said recently.

Formed in January 1956 by the merger of Soreng Products Co., Schiller Park, and A-P Controls Corp., Milwaukee, Controls Co. in 1956 had sales of \$27,391,948 as against \$23,694,103 the preceding year.

### 1956 RECORD YEAR FOR CRANE

Crane Co.'s 1956 sales reached an all-time high record \$375,220,878, an increase of 13.2 per cent over 1955 sales of \$331,421,289, it was announced in the company's annual report to shareholders.

Net earnings in 1956 were 20.6 per cent greater than the previous year. They totaled \$10,899,070, compared with 1955 earnings of \$9,030,206.

The Crane executives said there should be a "slight increase" in total sales of valves and fittings during 1957, but added that a decline in plumbing and heating sales "seems more than likely if the continuing dip in new housing starts is not reversed."

## BINKS DALLAS BRANCH MOVES TO NEW LOCATION

The Dallas, Texas, branch office of the Binks Manufacturing Co. has moved to a new building located at 8005 Sovereign Row, Dallas. Binks manufactures a complete line of spray painting equipment for industrial finishing.

Occupying a 23,920 square foot tract in the rapidly-growing Brook Hollow industrial area, the new Dallas location is one of a number of Binks office, warehouse, and service centers located in major cities throughout the country. The new 7,000 square foot building will house air conditioned office quarters, a complete parts stock, and well-equipped repair facilities staffed by factory-trained specialists.

## GE EXPANDS SILICONE PRODUCTS DEVELOPMENT FACILITIES

Construction of a new product and process development laboratory, and further expansion of other facilities of the Silicone Products department of the General Electric Co., at Waterford, N. Y., has been announced by Dr. Charles E. Reed, general manager.

Expected to be ready for occupancy in January, 1958, the laboratory is part of a \$3,000,000 capital outlay planned for the Waterford plant during 1957. More than \$1,00,000 worth of additional facilities were added, or nearly completed, during 1956.

Dr. Reed described the current expansion as part of a planned increase of all department facilities needed to study and manufacture silicone products to meet increasing industrial and consumer needs. An additional 69 acres of land adjacent to the original plant site were acquired during 1956 to provide space for future facilities.

## STEEL INDUSTRY NEEDS NEW THREE-POINT PROGRAM

A three-point program to assure maintenance of a "privately operated steel industry" was advocated by Joseph L. Block, president, Inland Steel Co., in the company's annual report.

Block said that steel's long-range earnings position must be improved if Inland and the industry generally are to be able to provide "the vastly-increased steel production facilities which will be required by the American people in the years ahead."

His program proposed:

- 1. Gradual price increases to offset the accumulated inflationary pressures built up in the last 15 years.
- 2. Continual cost reduction through technological advances.
- An up-to-date tax policy on depreciation so that wornout facilities can be charged off at replacement cost instead of original cost.

Block said that the problem of in-

adequate depreciation is common to all industry. He said his own company would have to replace equipment this year which he estimated would cost three times as much now as it had originally in the late 1920's. Depreciation allowances provide only the original cost, he emphasized, and the deficiency must be made up from retained earnings or new capital.

Price increases for steel since last July have not been sufficient to offset rising labor costs, and the sharp advances in prices of scrap and other purchased commodities and freight rates, Block said.

"We have not been able to increase our return on sales and invested capital," he said; "indeed, the comparisons with 1955 actually show a downward trend. Thus, the need for still higher price levels is indicated."

Block told stockholders that company mills are currently operating full at the new annual capacity rating of 5,500,000 ingot tons, and that he expected 1957 to be another good year.

Record business was reported for all subsidiaries and divisions of the company for 1956, consolidated sales reaching a new high of \$727,151,687 and earnings a new high of \$52,998,726, up from \$659,706,291 sales and \$52,466,098 earnings in 1955.

## INGRAM-RICHARDSON PLAYS HOST TO VISITOR FROM SWEDEN



The accompanying photograph shows Bengt Bram, (left) mechanical engineer of AB Centrifugalror, Oxelosund, Sweden, during a visit to Ingram-Richardson, Inc. at Frankfort, Ind. Shown with him is John Hurd, of Ing-Rich. Bram's firm manufacturers cast iron soil pipe. AB Centrifugalror also has an affiliate plant in Sweden that manufactures appliances. One of the main purposes of Bram's visit to this country was to check on current developments in the enameling of water heaters and the manufacture of frit.

### ARMCO HAS GOOD YEAR

Armco Steel Corporation produced a record amount of steel in 1956—enough, in the form of a thin sheet 30" wide, to circle the world 19 times.

As a result, last year proved to be one of the best years in Armco's history. The outlook for Armco in 1957 is good, even though competition will be keener due to greatly expanded capacity in the steel industry, the report stated.

During 1956, the report pointed out, Armco increased its steel capacity by 800,000 net tons, or about 15 percent. By mid-1959, the company expects to complete construction of additional facilities which will increase ingot capacity by 750,000 tons annually, bringing the company's total ingot capacity to nearly 7,000,000 tons.

Mounting employment costs, without a corresponding increase in productivity, and rising prices for materials and services represent serious problems to the steel industry today, the report pointed out. It added that Armco people are hard at work attempting to develop more efficient production methods and techniques to offset these increasing costs. "The retarding of inflation," the report stated, "would be one of the healthiest single economic developments that could take place in this country."

Armco's net earnings in 1956 amounted to \$65,593,182, compared to \$64,350,609 in 1955.

## BEST PACKAGE DESIGN AWARDED TO DESOTO

United Wallpaper, Inc. announces the awarding of the Brame Gold Medal Award, signifying first place, to DeSoto Paint & Varnish Co., Garland, Texas. This medal was awarded to DeSoto for the best package design entered in the Art Directors Club of Denver annual competition to select the best examples of advertising art and creative design

produced West of the Mississippi during the past year.

Accepting the award for DeSoto Paint & Varnish Co., and for himself, was the creator of the package design, Jerald O. Page, Dallas advertising artist and designer.

Page's award-winning package design is the red, white and blue label which he produced for DeSoto's complete line of industrial finishes.

Milar & Company, a United Wallpaper sales organization, will use a modified form of this label for its railroad finishes.

The medal was presented to Page at the Annual Exhibition and Awards Dinner held March 8, 1957 at Denver's Mile High Art Center.

## BEDE SCHEDULES CLASSES IN AIRLESS SPRAYING

Regularly-scheduled training classes in the proper operation and maintenance of Bede Airless spray painting equipment has been announced by President Eric Nord, Bede Products Corp., Amherst, Ohio.

To date, seven introductory classes have been conducted with considerable success. A new training and technical services building has been erected and is being used as the training center. Classes are conducted over a four-day period during the second week of each month. Forthcoming classes are scheduled as follows: April 9-12, May 14-17, June 11-14, July (July has been omitted considering vacation periods), and August 13-15.

Subjects covered during each class are: A) Theory of Airless process. B) Equipment study which includes actual equipment disassembly and reassembly. C) Equipment operation procedure. D) Preventive maintenance and repair. E) General study of Airless finish formulations. F) Airless finishing techniques.

Classes are open to all interested per-

sons including present Airless equipment users, chemists or paint formulators, equipment manufacturers, and others. There is no tuition charge for attending. For application blanks or additional information regarding the Pede Airless Training School, write to Bede Products Corp., Amherst, Ohio, attention R. T. Schafer.

### WESTERN RESEARCH CENTER FOR ROBERTSHAW-FULTON CONTROLS

Robertshaw-Fulton Controls Co. will begin construction of a \$250,000 Western Research Center within the next two weeks, it was announced by T. T. Arden, executive vice president.

The new facility will be located on a five-acre site at Anaheim, Calif., and has 15,000 square feet of floor space.

Arden, who is in charge of Robertshaw-Fulton's Western operations, said the new center will carry on basic and applied research in the fields of automatic controls for air conditioning, home heating, domestic and commercial water heating, cooking, food preservation, and home laundering appliances.

## NSMPA ELECTS OFFICERS AT WASHINGTON MEETING

New officers and trustees of the National Screw Machine Products Association were elected at the association's annual meeting at the Shoreham hotel, Washington, D. C.

NSMPA, with national headquarters in Cleveland, is the trade association for more than 280 producers of screw machine parts whose output constitutes more than 70 per cent of total national production.

The new president is Dana B. Jefferson, Jr., partner of the Walker Manufacturing Co., Medfield, Mass. Elected vice president was C. J. Baumgart, president, Screw Machine Engineering, Inc., Chicago; re-elected as treasurer was Leonard R. Schaffer, president,

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Mechanical Art Works, Inc., Newark. Also re-elected were Orrin B. Werntz as counsel and executive vice president of the association, and Margaret S. Ballinger as secretary.

New trustees elected include Francis P. Trinkhaus, president, Crellin Machine Co., Los Angeles; Elwood Leonard, partner and general manager, H & H Screw Products, Inc., Providence, R. I.; Charles L. DeMartin, president, General Screw Products Corp., Rochester; and Charles L. Kerr, president and treasurer, Kerr-Lakeside Industries, Inc., Cleveland.

### BINKS EARNINGS FOR 1956 UP 56 PER CENT

The annual report of Binks Manufacturing Co., released recently, shows a 56 per cent increase in earnings, and a



sales rise of 16 per cent, both new record highs for the fiscal year ended November 30, 1956.

Burke B. Roche, president, said earnings were \$939,470, after all c h a r g e s and provisions for

taxes on income, compared with net income of \$603,657 the year before.

The 1956 earnings were equal to \$5.07 per share based on 185,332 shares of capital stock outstanding on November 30, 1956, as against \$3.52 a share on 171,389 shares outstanding on November 30, 1955.

For the first quarter ended February 28, 1957, net income was \$122,280, equal to 62 cents a share based on 196,602 shares of capital stock outstanding. Earnings in the comparable three months the preceding year were \$106,216, equal to 58 cents a share on the 182,287 shares of capital stock then outstanding.

First quarter income before Federal income taxes was \$254,750 and \$221,-284, respectively.

Binks is a leading manufacturer of spray painting equipment and complete spraying system.

### O. HOMMEL'S SYLVESTER PASSES

J. Harrison Sylvester, 43, plant superintendent of the O. Hommel Co., Carnegie, Pa., died on March 19. He began his career with the company in the accounting department in November, 1935. In 1937, he was promoted to assistant plant superintendent, and in 1940 was named plant superintendent.

## ARI REPORTS 32 PER CENT GAIN IN COMPRESSOR SHIPMENTS

Manufacturers', shipments of compressor bodies reported to the Air-Conditioning and Refrigeration Institute for the calendar year 1956 totaled 4,775,843 units, not including compressors for household refrigerators, a gain of more than 32 per cent over the 1955 figure of 3,607,786 units, Geo. S. Jones, Jr., managing director of ARI, reported.

Of the 1956 total, 284,022 compressors were for automotive air-conditioning, compared with reported shipments for the year 1955 of 255,371 automotive units.

December 1956 shipments totaled 305,283 units, of which 28,674 were for automotive air-conditioning use.

The figures were prepared on the basis of reports from 18 manufacturing companies, estimated to represent more than 90 per cent of total U.S. production of compressor bodies of the types covered.

Of the 1956 shipments, 88.2 per cent were sold by manufacturing companies as compressor bodies, compressors, or condensing units. The remainder, 471,-112, amounting to 11.8 per cent, were sold by their manufacturers in unitary end-use products, such as room or selfcontained air-conditioners, display cases, commercial refrigerators, and similar products. Other manufacturers purchased 83.7 per cent of the total, and distributors, jobbers, dealers, retail customer and other non-manufacturers accounted for the remainder, largely in end-use products. (Figures on these sales do not include units for household refrigerators, automotive airconditioning, or those designed for use with ammonia refrigerants).

## INDUSTRIAL HEATING ASSN. REPORTS FEBRUARY SALES

Orders received for industrial furnaces dropped while orders for induction and dielectric heating equipment rose during February, the Industrial Heating Equipment Association announced.

Orders for industrial furnaces received during February 1957 totaled \$8,373,120, compared with \$12,162,877 for February a year ago. This represents a decrease of 31 per cent. Orders received for the first two months of 1957 total \$15,752,824, 30 per cent less than the \$22,406,943 figure for the comparable period of last year.

A brighter picture was presented by

the induction and dielectric heating equipment industry, however. Orders for such equipment totaled \$1,674,931 for February as against \$917,953 for February of last year — an 82 per cent increase. For the first two months of this year, orders for induction and dielectric equipment total 2,784,505 as against \$2,143,292 — up 30 per cent over last year.

## MID-YEAR DIVISIONAL CONFERENCE ANNOUNCED BY PEI

The Porcelain Enamel Institute's Mid-Year Division Conference will be held at the Edgewater Beach hotel, Chicago, May 9-10, according to John C. Oliver, managing director of PEI. The meeting, which is held annually for members of PEI and their invited guests, will consist of a series of informal and practical working sessions. The Institute's Architectural, Sign, and General Enamel divisions will each hold separate conferences at which time current developments in their respective fields will be discussed.

Some of the important topics to be presented at the architectural meeting include discussion and distribution of PEI's long-awaited manual on curtain wall construction; the revised standards and specifications for veneer-type porcelain enamel panels, and the proposed standards and specifications for insulated panels.

At the meeting of the Sign and General Enameling divisions, subjects pertaining to the organization and future plans of each of the groups will be discussed.

## UNIVERSAL VISE ACQUIRES TOOL CLAMPING SYSTEM

Nelson Beaman, president of the Universal Vise and Tool Co., Parma, Mich., announces that Universal has acquired all manufacturing and sales rights to the integrated machine tool clamping and set-up system formerly produced by Techno Products Inc., Cleveland, Ohio.

The line, marketed under the trade name "Q" Clamps, is an integrated system for use in clamping all types of work to machine tool tables. It is of particular usefulness on boring mills, milling machines, planers, and radial drill presses. Impressive savings in setup time are reported by users.

The manufacture and distribution of the newly-acquired line will be carried on by Universal Vise and Tool Co. from its office and plant at Parma.

### SUPPLIER PERSONALS

James R. Fleming has been named sales engineer for Kelvinator's contract sales department, and assigned to cover sections of Illinois, Indiana, Ohio, Wisconsin, Iowa, and Minnesota.

Henry R. Merrill, since 1955 general sales manager of Behr-Manning Co., Troy, N. Y., a division of Norton Co., has been appointed vice president in charge of sales.





MERRILL

James W. Mesman has been appointed sales manager of national accounts for the fibre drum and corrugated box division of Continental Can Co., Peter P. Wotjul, vice president and general manager of the division, has announced. Mesman will be in charge of national accounts for corrugated boxes, with headquarters in the division's New York office. He will report to Charles U. Harvey, division sales manager for corrugated boxes.

Appointments of Fred T. Ehlert as superintendent of the yards and services division, and William E. Schultz as superintendent of the shipping and warehouse department, were announced recently by Acme Steel Co. Ehlert joined Acme in 1936, and Schultz was employed in 1928.

Frederic E. Crist, formerly assistant to the president, and secretary of Sun Chemical Corp., New York, has been appointed director of industrial relations for Associated Spring Corp., according to an announcement by Carlyle F. Barnes, president of Associated Spring Corp.

Robert L. Larson has been appointed general manager of the new Indianapolis, Ind. plant now under construction for Joseph T. Ryerson & Son, Inc., steel distributor, announced Charles L. Hardy, president. The plant will be completed in September, it was reported.

Lynn F. Jorgenson has been named Chicago sales manager, and manager of the sales training program, at Rolled Steel Corp., Skokie, Ill., distributors of sheets, bars, plates, and structural steel products, it was announced by Seymour Waldman, president. Jorgenson joined the Rolled Steel sales department in 1948 after 26 years with Pittsburgh Steel Co., and Keystone Steel and Wire, Peoria. Ill.

George Milburn has been appointed sales supervisor of The Patterson Foundry and Machine Co. (Canada) Ltd. Joining Patterson in 1946, he was named district manager of the Montreal office after a short period in the Toronto sales office. In his newly-created position, Milburn will coordinate district sales activities in Canada to facilitate customer service. He will continue to maintain headquarters in Montreal.



JORGENSON



MILBURN

John A. Metz, Jr., Pittsburgh, Pa., and Richard E. Whinrey, Indianapolis, Ind., were elected directors of Link-Belt Co. recently at the annual meeting of the company's stockholders, it was announced by Robert C. Becherer, president. Metz is a partner of the Pittsburgh law firm of Metz, McClure & McAlister. Whinrey is vice president of Link-Belt, and general manager of the company's Ewart plant in Indianapolis.

John M. Curley, president of Eastern Stainless Steel Corp., Baltimore, Md., recently announced retirement of the corporation's director of sales, and the appointment of his successor. The new executive is Richard C. Cunningham, manager of stainless sales for Industrial Stainless Steels, Inc., Cambridge, Mass., a wholly-owned warehousing and sales subsidiary of Eastern. He succeeds Edward A. Haggenmuller, who has reached the age of 70, and whose retirement is in accordance with Eastern's established policy.

Merle W. McLaughlin has been appointed vice president in charge of manufacturing of Copeland Refrigeration Corp., Frank J. Gleason, president, announced. Prior to joining Copeland, and since 1953, McLaughlin was general manager of the Traverse City, Mich., divsion of the F. L. Jacobs Co., manufacturers of automotive parts, ordinance instruments, and commercial refrigeration cabinets.

Harvey E. Bland has been appointed manager of the Technical Service department of The Diversey Corp., Chicago, international manufacturer of sanitation chemicals for the food, dairy, and metal processing industries. He recently returned from a seven-week assignment in Venezuela where he advised food processors on recent developments in food sanitation techniques. This work was done in conjunction with Consolidadas, S. A., one of Diversey's South American subsidiaries.

Gerhard Reyerse has been named Cincinnati district sales manager for the Patterson Foundry and Machine Co., it was announced by E. A. Sisson, director of sales. He comes to Patterson from Ferro Corp., where he was chief sales engineer of the International division. Jack E. Wright, former sales manager of the Cincinnati district, has been promoted to product manager in charge of size reduction and classification at the home office.



BLAND



REYERSE

James G. Caffrey has been appointed metropolitan district manager of the newly-established New York sales district of The O'Brien Corp. He will supervise two territorial representatives of the firm, which has paint manufacturing plants in Baltimore, Md., South Bend, Ind., Oklahoma City, Okla., Los Angeles and San Francisco, Calif.

Hardie W. Beck has been appointed to the newly-created post of sales manager for the Pittsburgh steel service plant of Joseph T. Ryerson & Son, Inc., A. L. Petersen, general manager, announced.

J. Richard Garvin has been appointed manager of manufacturing at the General Electric Company's specialty transformer department in Fort Wayne, Ind., according to an announcement by C. H. Rinne, department general manager. Garvin succeeds Richard J. Keyser, who has been assigned to the manufacturing services division in New York City as consultant - shop operations.

Paul Cain has been appointed director of industrial engineering for Armco Steel Corp., Middletown, Ohio, according to an announcement by Frank H. Fanning, vice president of planning and development. His services, and those of his department, will now be available to all divisions and subsidiaries of Armco. Malcolm Reed, George G. Davis, Mark S. Scheibert, and Carl Funk have been appointed supervising industrial engineers.

A. E. Ault, vice president-sales, Chicago Vitreous Corp., a division of The Eagle-Picher Co., Cicero, Ill., manufacturers of porcelain enamel frit, has been elevated to general manager of the entire company, according to an announcement by William Hogenson, president. Ault, a graduate of Ohio State university, first joined Chicago Vitreous in 1936. In the intervening years he has served in a number of capacities in his rise to leadership of the company.





AULT

Appointment of Russell F. Sanders as director of engineering and sales at the Rochester Products division of General Motors was announced by Wallace E. Wilson, general manager.

Sanders, a former assistant chief engineer at the Chevrolet Motor division of GM, succeeds Elmer Olson who has been granted a leave of absence for medical reasons.

Sanders has been serving as Chevrolet assistant chief engineer in charge of engine and passenger car chassis design since July, 1956, and has been associated with the automobile industry for 34 years.

Drake Manufacturing Co., Chicago, announces the appointment of Jack Krutek as sales manager, and William Wende as assistant sales manager.

Krutek, who is secretary of the company, has been with Drake for more than 10 years in various capacities; his newly appointed assistant, Wende, joined the Drake sales department a year ago.

Drake is one of the country's largest exclusive manufacturers of miniature highting assemblies and lampholders.

D. R. Goetchius, manager, ceramic sales, Ferro Corp., Cleveland, Ohio, recently announced personnel changes in the sales division of the company. A. W. Thomas, service engineer in the New York territory, is being transferred to a similar position in the Nashville territory. H. W. Fishkin, formerly with the Ferro Chicago sales group, is replacing Thomas in the New York area. N. C. Franko is leaving Smith & Stone, Ltd., Georgetown, Ont., Can., and will assume the responsibility of glaze frit and color sales in Chicago.





FISHKIN

David C. Verson, president of Verson Allsteel Press Co., Chicago, has announced the appointment of Dr. Hubert J. Pessl, ASM, to the post of director of research and education for the company. During the past two years, Dr. Pessl has served as a consultant for Verson's research and development center and, until recently, was director of shell engineering and research for the Gibson Refrigeration Co., Greenville,

The appointment of R. W. Couch as manager of Electrochemical Research and Development has been announced by Metal & Thermit Co., Rahway, N. J. Couch is a graduate in chemistry of Wayne State University. He has been with Metal & Thermit and its former subsidiary, United Chromium, Inc., in various research and supervisory capacities since 1941. In his new post he assumes the overall management of the company's Detroit and Michigan laboratories.

Hanson-Van Winkle-Munning Co. has announced the appointment of Alexander Alexander to the post of finishing engineer in its Chicago area.

In this capacity, Alexander will assist H-VW-M salesmen in fifteen midwestern states in problems and service relating to the buffing and polishing of metals and plastics.

Hanson-Van Winkle-Munning Co. announced the appointment of Henry B. Koehler as electrical sales engineer. In this capacity Koehler will concentrate on the engineering and sale of motor generator equipment for the metal finishing industry.





Appointment of Elmer W. Beck as general manager of refractories operations was announced by C. D. Clawson, president, Ferro Corp., Cleveland, Ohio. The newly-created position will bring about the coordination of the management of three Ferro subsidiaries manufacturing refractories. C. G. Gerster, who has been executive vice president of Louthan Manufacturing Co., will continue on its board of directors, but will devote full time to his position as president of Patterson Foundry and Machine Co., East Liverpool, Ohio. Fred A. Layne, formerly sales manager of Louthan, has been promoted to the position of works manager, and will be responsible for both sales and manufacturing at Louthan. W. H. Corban, formerly sales manager of Ceramic Supply division, will become works manager. Dwight Haley has been appointed works manager of the American Clay Forming Co., Tyler, Texas.

Appointment of Frederick F. Rhue to the newly-created position of administrative assistant to the vice president of the paint and brush division, Pittsburgh Plate Glass Co., has been announced by C. R. Fay, vice president, paint and brush division. Rhue formerly served as manager of sales service for the company's Forbes Finishes division in Cleveland.

### A report on a porcelain enameled air marker

-> from Page 47

the letters, and the result is a permanently effective marker for the safe guidance of a non-scheduled flyer.

This marker also offers an excellent example of how ingenuity can offset shortages or other difficulties when there is a desire to accomplish an end.

### Report after nine years service

It was felt that our readers would be interested in the condition of the air marker after nine years of exposure on the plant roof. In checking with William Lowry, vice president of Vitreous Steel Products Company, his brief comment was as follows: "The plant has grown in the last ten years; we're a little bit older than we were at that time — but the porcelain enameled air marker is every bit as good as it was the day we put the sign on our roof."

Mr. Lowry further states, "The conditions to which this marker has been exposed are extremely severe. On one side of the sign, ventilators from our pickle room exhaust acid fumes, steam, and vapors. On the other side of our sign, the gases from our boiler room stack, and from our porcelain enameling furnaces, have added to the general attack. And, to give us a full measure, a main line of the B&O Railroad runs within 100 feet of the sign, and through the years the winds have carried smoke from switch engines onto the porcelain enameled marker. Throughout the years of service our air marker has had periodic cleanings. After nine years of exposure the sign retains essentially its original color. The gloss, as one might expect, has been somewhat reduced."

### Opportunities for market development through trade associations

→ from Page 41

to implement.

A. First it means the formation of new committees: A market research committee, a product analysis committee, and a publicity and advertising committee.

B. Then it means getting willing and capable individuals to serve on those committees; Men who have the specialized knowledge of the work involved plus the enthusiasm and energy to work at getting the job done. It means committees that work throughout the year, meeting not just at the annual convention, but at regular intervals—quarterly

or even oftener. Most important of all, the time and money spent on such effort will have only as much benefit to you as the effort and interest you take in it.

### Three vital points for participation:

It has been Armco's experience in working with various associations that the following three points are most vital if any company is to realize the full worth of trade association market development.

1. Develop a follow-up plan in order that each individual company may be able to capitalize on the work of the various committees. Someone should be appointed in each company to receive leads, inquiries, and reports, and to see that they are called to the attention of the proper individuals so that something can be done about them.

2. Cooperate with the committees. In any work of this kind the committee chairman will have frequent occasion to call upon member companies for information, photographs, etc. Too often such calls for help are ignored. Committees are thus left to do the job alone, and their enthusiasm is dampened by the lack of interest and support.

3. Express your appreciation. There is still nothing that beats a word of praise — a pat on the back for a job well done. When a committee does an outstanding job for the benefit of the industry, such a word from each member personally will win even greater effort on the part of the individuals concerned.

### Another case history:

The Metal Roof Deck group affords another particularly pointed illustration. For years this organization was composed of a group of manufacturers, each fighting the other, each trying to keep his own little secrets. Consequently, metal roof deck was relatively unknown. Then they got together on a cooperative industry promotion program, and metal roof deck became the widely used material that it is today. As the industry grew — so did the member companies.

### Important corrosion factors in Home Laundry Equipment

→ from Page 55

rapid rate. Therefore, if a dew point of 140°F is not exceeded by the atmosphere in the unit, the attack should not be a problem. (Note: the 140°F temperature is an estimate and not accurately determined.)

Methods of controlling the dew point night involve the following:

1. Controlled rate of heat increase.

2. Volume of outside air, if the unit is of the exhaust type.

3. Area of the condensing section in a closed circuit unit.

 Circulation of atmosphere to obtain efficient condensation in relation to the pickup of moisture from the load.

### **Problem approaches**

a) Air circulation control—To obtain a cycle of — one, condense moisture, two, heat air, and three, pick up moisture from load — would be a general approach to the closed circuit drying problem. This is an over-simplification of the problem, but it is well founded in principle.

b) Abrasion of surface — Exactly the same concepts as outlined under alkali and hot water attack would be involved from the standpoint of abrasion. One additional concept could be considered. This would involve removal of abrasives such as sand, grit, etc., from the washing area as these materials are removed from the fabric, as opposed to retaining this material on the surface of the unit.

c) Gouging of the surface — This attack will predominate on inner edges of flights, and appears to the greatest extent on smaller radii that are exposed to items which are sufficiently heavy and of proper contour to gouge into the porcelain enamel surface. Therefore, consideration of contour of the inner surface of the unit, and the force imparted to the heavy objects in the load, are important from a gouging standpoint.

### Summary

The following points are of importance with regard to the corrosion of the porcelain enamel surface in laundry units:

A) Solution by alkali or hot water is accelerated by constant removal of film from the surface.

B) Water condensate attack occurs when the condensate forms on a surface at relatively-high temperatures ( $150^{\circ}$  to  $212^{\circ}F$ ).

C) Abrasion is not encountered as the sole cause of corrosion, but is combined with alkali and hot water corrosion and surface film removal.

D) Gouging of the porcelain enamel surface is not a predominant failure, but can be encountered under unusual conditions.

"Milling With Chemicals," originally scheduled for this issue, will appear in the June issue instead.



# Supplies and Equipment

### SNAP-IN NYLINERS



Standard sizes of a new type of nylon bearings, known as "Type 7" snap-In NYLINERS, are now being manufactured. These new bearings have a flange on both ends which retains the bearing in a hole in sheet metal or thin plates of any material. One of the flanges has sufficient area to take normal thrust loads. The bearings are provided with a helical split, called a compensation gap, which is equal in width to the expansion and contraction of nylon due to temperature changes and moisture absorption. Dept. MPM, Thompson Industries, Inc., Manhasset, N. Y.

### GAS HEATER CONTROL

An automatic gas heating control, the Model 400-E, for use with warm air furnaces, combines gas cock, thermostatic valve, and automatic pilot in a single compact unit. The control's thermostatic valve utilizes the heat motor principle, operates on 24 volts ac, and is suitable for use with all types of room thermostats. The unit has a snapaction gas valve for positive and completely silent operation, and the automatic pilot is of the 100 per cent shut-



MPM MAY . 1957

off type. Due to its compactness and clean, streamlined assembly, the unit is easy to install, according to the manufacturer, and only two pipe fittings are necessary. Robertshaw-Fulton Controls, Grayson Controls Div., Long Beach Blvd. at Long Beach Freeway, Long Beach 6, Calif.

## AUTOMATIC SPRAY DECORATING MACHINE

A new unit, consisting of an automatic spray decorating machine, a



maskwasher, and spray booth all integrated into one compact package, has been introduced. It comprises short or long runs, a rapid-action washer for cleaning the paint masks, and a steel spray booth with an opening provided for connection to the existant exhaust system, according to the manufacturer. Varied sizes and shapes of parts may be sprayed by rotation, assuring an even deposition of paint and true uniformity of coating. The unit is completely air motivated, and is automatically oiled. Dept. MPM, Conforming Matrix Corp., 381 Toledo Factories Bldg., Toledo 2, Ohio.

### ALUMINIZING EQUIPMENT

A high-production unit for aluminizing color TV plates, or the screens of black-and-white picture tubes, interchangeably, has been developed. The equipment is a self-contained unit, with its own vacuum pumping system, which can handle two color plates or two black-and-white tubes at the same time. For color plates, a removable metal



cone supports the plates. To switch to black-and-white tubes, all that is required is to remove the cones and insert the necks of the tubes into the openings of the evacuation chamber. Dept. MPM, F. J. Stokes Corp., 5500 Tabor Rd., Philadelphia 20, Pa.

### ZINCATE BATH FOR TREATING ALUMINUM

A new, improved zincate bath for the treatment of aluminum prior to plating has been developed. Known as "Alkalume Pre-plate," the bath is said to have the ability to deposit an extremely finegrained, uniform coating in one pass; eliminates adhesion problems; has low surface tension which results in faster draining and reduced dragout; and has a tolerance for chrome which assures continuous operation and longer life. The chrome is converted to a harmless form that eliminates the disposal problem. Dept. MPM, Northwest Chemical Co., 9310 Roselawn Ave., Detroit 4, Mich.

### BENCH TYPE PRESS

A three-ton power bench-type deep throat punch press, specially designed for small tonnage operations requiring large throat space, can perform many operations heretofore requiring a much larger press, according to the manufacturers. The unit will perform up to 300 operations per minute on continuous punching, forming, blanking, cutting, drawing, shearing, riveting, etc., it is claimed, and material worked may be metal, leather, plastics, fibre, textile, paper, or any workable material within the rated capacity of the press. Dept. MPM, Alva Allen Industries, 1001-15 N. Third St., Allen Bldg., Clinton, Mo.



### CORROSION KEYS FOR ALUMINUM

This brochure is intended primarily as an aid to engineers designing aluminum into process plants or equipment, although it will be of interest to those concerned with other applications of the metal. The brochure makes extensive use of graphs, which tell at a glance the yearly corrosion rate of more than 100 chemicals, and other corrosive materials on aluminum.

While pointing out that few metals can equal aluminum's resistance to chemical attack, the brochure emphasizes that the choice of an aluminum alloy should be based on a number of factors besides corrosion resistance. The graphs are intended as an aid in the selection of aluminum as a construction material. Dept. MPM, Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.

### 1957 CATALOG OF GE HEATERS AND DEVICES

A 16-page power requirements section, showing short and long form calculations for heating applications, is included in a new 1957 catalog of heaters and heating devices. The 72-page publication includes information on such new products as redesigned cartridge heaters, miniature soldering irons, aluminized steel sheath strip heaters, and new ratings and configurations of finned tubular heaters. Also described are the new ceramic-to-metal and plastic resin hermetic seals.

In the power requirements section, each heating process is described. Typical application problems are solved to give heating requirements in both a long and a short form method. Send for bulletin GEC-1005H, Dept. MPM, General Electric Co., Schenectady 5, N. Y.

## BLUE DATA SHEET ON STAINLESS TYPE 201

The 4-page technical sheet gives detailed information on this chromium, nickel manganese stainless steel. Such information would include analysis range, resistance to corrosion, resistance to oxidation, physical properties, and mechanical properties. Short sections

are also included on the welding characteristics and fabrication of this steel. A copy of the Blue Data sheet entitled "Allegheny Ludlum Stainless Steel Type 201" can be obtained by writing Dept. MPM, Advertising Department, Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.

## PRINTED AND DIE-CUT PRESSURE-SENSITIVE TAPES

A new 3-page foldout brochure describing uses and applications for printed and die-cut pressure-sensitive tapes is available. It illustrates in color how printed tapes are used to identify standardized stock items, and to bundle and identify pipe and barstock in one operation. Printed tapes are also used as labels on products to instruct, promote, price, or to carry any point-of-purchase sales message. The brochure shows also how die-cut tapes can be prepared in almost any size and shape to mask or protect odd-patterned surfaces, and for use as a fabricating material in separating dissimilar metal surfaces. Write to Dept. MPM, Minnesota Mining and Mfg. Co., Dept. L7-48, St. Paul, Minn.

### ELECTROPLATING BOOKLET

A booklet describing chemical processing of copper, brass, cadmium, and zinc is available. Metal cleaners, including general all-purpose soak cleaners, electrolytic cleaners for zinc base die castings, brass and copper, and an anodic high detergency cleaner for removing smut from steel, etc., is also covered. Wagner Brothers, Inc., 400 Midland, Detroit 3, Mich.

## 16-PAGE BULLETIN ON INDUSTRIAL CERAMIC PRODUCTS

This new bulletin covers high density and standard porcelain mill linings; lifter bars; special mill lining shapes; mill head assemblies; high density and standard porcelain grinding balls; metal covered and ceramic laboratory jars for cradle or roller type laboratory mills. The bulletin also contains information on how to order, and dimensions and pictures of the products discussed. Write for bulletin B1-56, Dept. MPM, Mc-

Danel Refractory Porcelain Co., Beaver Falls, Pa.

### RACKS FOR INDUSTRY

Free Racking Catalog, covering racks, fixtures, and accessories for the plating and materials handling industry, is available by writing to Imperial Rack Co., Oxford St., East, London, Ontario, Canada.

## PLASTIC FASTENERS FOR BLIND FASTENING

The manufacturer offers a free sample packet, and an informative brochure, listing 25 standard Plasti-Rivets. They are molded of thermoplastics and fasten from one side with a single blow. The prongs expand when the integrally-molded pin is driven, providing a positive, vibration resistant lock. Ideal for fastening of electrical products, name plate attachments, appliance shelf fastening, etc. Write Dept. MPM, Fastex Div. of Illinois Tool Works, 195 Algonquin Rd., Des Plaines, Ill.

### **ALUMINUM COIL IN COLORS**

Manufacturers can now turn out handsomely-finished aluminum products in a variety of organic finished colors directly from their roll-forming machines, press brakes, or draw or punch presses, without subsequent finishing operations. A brochure is available which describes the new colored coil, pointing out also that the finishes, called "Colorweld, are pre-enameled, prefinished, and are flexible, resistant to scratches, abrasions, and weathering, offering unlimited color choices. Dept. MPM, Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.

### **BULLETIN ON FILTER TYPES**

A new 8-page brochure illustrating six major filter types for industrial applications is available. Many types of filters are covered in the booklet, and applications include all types of fluids from water to heavy viscosity oils and lubricants. Dept. MPM, Industrial Filtration Co., Dept. GB-317, Lebanon, Ind.

## HOW TO FABRICATE STAINLESS STEELS

A comprehensive 40-page manual which gives all the latest information on the approved techniques for fabricating stainless steel is now available. All who work with stainless will find this book full of valuable information. Dept. MPM, Adv. 590a, Republic Steel Corp., Adv. Div., 3100 E. 45th St., Cleveland 27, Ohio.





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Many of the problems you ordinarily would face are minimized . . . sometimes eliminated entirely . . . by Pemco. The uniformity you demand, the results you deserve as a Pemco customer, are assured before the frit reaches you. Both time and temperature of Pemco's continuous smelters are automatically controlled at all times. Once a new type of frit is produced—the exact same type can be duplicated time and time again.

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# Fabricating Westinghouse room air conditioners

-> from Page 23

Two are 600 ton size, one is 400 ton size, and one is special for rotors. The big benefit indicated for electric melting is more uniform temperature control of molten metal as well as less contamination of metal during melting. The need to flux the metal periodically is eliminated.

The compressor housings are cast in single cavity molds. Cast iron insert sleeves for cylinders are placed in the die manually. From this point in the cycle, the machine operates automatically. The die closes, the molten aluminum is automatically ladled into the mold: machine holds to allow metal to chill; die opens and piece is retrieved by mechanical hand and placed on a belt conveyor that returns piece to operator. While the casting machine cycles, the operator trims the gates and then places it on a conveyor that carries it to a barrel tumbler where steel shot is fired at the casting to remove any flash. Casting is then sent to the machining area by conveyor.

Machining the compressor housing is done automatically. So is the gaging. The housing casting is placed first in a rotary-type boring, milling, drilling, and tapping machine that has a hydraulic power clamp for holding the work piece. This machine tool rough machines the housing at a rate of one every 30 seconds. The casting goes next to finish machining for precision boring the cylinder and bearing holes.

A way-type boring mill is used to finish machine the compressor housing. Cylinder diameter and concentricity are verified with air gages. Dimensions at this stage are held to tens of thousandths. The housing now moves to the honing machine.

Honing of the cylinder bore is done in a microfinish hone to obtain the surface finish and dimensional tolerance required. Following honing, all machined surfaces are verified in a single fixture.

The crankshaft for the compressor is a steel forging. All bearing surfaces are first machined, then flame hardened and the dimensions checked in one fixture. The main bearing surface and outboard bearing surface are ground to finish and size in a two-wheel centerless grinder, while the connecting rod bearing surface is ground to finish and size in a single-wheel centerless grinder

with automatic wheel dressing and wear compensation. Dimensional gaging of the bearing surfaces is done in the grinding position.

### Miscellaneous Compressor

### **Parts Fabrication**

The aluminum die-cast connecting rod is placed in a three-spindle precision boring machine where wrist pin and crankshaft bore are made with one handling of the piece. Operator checks dimensional tolerance with air gage while machine cycles.

The aluminum piston is chucked in an automatic turning and facing lathe where it is turned, faced, and grooved. Dimensional tolerances of each piston are checked in an air gage while the next piece is being machined. The piston is then placed in a centerless grinder where it is rough ground. Outside diameter tolerance is checked by operator while next piece is being ground. The wrist pin hole is rough and finish bored in one chucking oper-



ation on a double-end horizontal precision boring machine. Again, the dimensional tolerance of the bore diameter is checked. The finish grind is performed on a centerless grinder following which the usual dimensional tolerance check is made.

The outboard bearing is bored, faced, and chamfered on a double-end precision boring machine. Dimensional tolerances are checked by the operator in a single fixture.

The cylinder head is loaded in an

automatic indexing, milling, and tapping machine where the gasket face is milled, drilled, and tapped. All machining operations are done in one loading. The operator checks dimensional tolerances while the next piece is undergoing machining.

Both surfaces of the valve plate are ground to finish on a two-wheel horizontal disc grinder. The piece is then counterbored, drilled, and tapped on an automatic indexing, milling, and tapping machine. The valve is honed by slidabrading. This removes rough and sharp edges as well as die marks. The desired finish is to have a valve smooth and flat with slightly rounded edges or corners.

### Air Conditioner Assembly

The initial step in the assembly of a room air conditioner is to take an assembly base for the compressor, condenser, and evaporator from the storage conveyor and place it on a pallet on the assembly conveyor. From that point on build-up is rapid: a small electric hoist picks up a compressor from the storage conveyor and places it on rubber vibration-damping studs in the assembly base; the condenser, and then the evaporator are removed from storage conveyors and attached in sequence to the assembly base; next the strainer: then the suction, discharge and capillary tubes are brazed to the compressor, condenser and evaporator to complete the refrigerant circuit. Hansen valves are then attached to the compressor and the partially-assembled unit is tested.

The build-up continues with the attachment of the plastic evaporator shroud. The control panel is attached next and it is followed by the fan system and condenser shroud. Support brackets, seal bracket, condenser cover, evaporator cover, shroud insert, follow in quick order. All electrical connections are then made and cord clips attached. The unit is now ready for these preliminary electrical tests: insulation, high-voltage start, fan speed, fan watts and compressor motor watts.

Following this test, the control box cover is sealed to prevent moisture getting into it and insulating tape is wrapped around evaporator brackets. The unit is then performance tested by giving it a run-in test, by measuring the volume of air moved by the fan, by measuring the Btu's of cooling capacity, and by measuring the noise level.

After the performance test, the cabinet and shipping base are attached. Then the identifying decalcomanias are put on, the louvered back attached, and the plastic front packed and attached with masking tape. The shipping carton is slipped over the unit and stapled to the base. Packing is added and the top stapled shut. The packaged unit is conveyed to the warehouse. (See materials handling story, "Automatic Conveyor System Simplifies Appliance In-plant Handling," in Safe Transit Section.)

### When finishing equipment quits...

# Binks NATIONWIDE SERVICE is real production insurance

Somehow someone damages a spray gun...or the part that should have been replaced weeks ago finally "gives up the ghost." Annoying? Yes! Fatal to your production? No...not if the gun is a Binks!

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**Engineering assistance too.** It may be that you need engineering assistance to help lick a finishing production problem. If you do, it is as close as your phone.

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## **AHLMA 41st annual meeting**

A PRESSTIME REPORT by Dana Chase . EDITOR MPM

THE 41st annual meeting of the American Home Laundry Manufacturers' Association set a record for attendance, according to information from the AHLMA staff. For the first time in association history, the annual meeting normally held in Chicago in January, and the summer meeting, at which the Associate members play host to the group at a resort location, were combined into a spring meeting for 1957.

## Builder and designer voices ideas for future appliances

Among the key speakers on the "Imagineering" program, moderated by Jack Lee of Westinghouse, were Martin Bartling of the National Association of Home Builders, and Joseph Mango, industrial designer.

Mr. Bartling advised the manufacturers to put the problems of service high on their priority list. He said that the builders are interested in what the manufacturers do for 1957—and feel that they (the manufacturers) have within their power the development of many ideas and improvements that have not as yet been called on.

The possibilities for pre-wiring and pre-plumbing were suggested.

Bartling feels that there are answers to code and union problems, and a possible solution is to work with them in connection with development of new products.

"Your distribution system is badly in need of overhauling", Bartling warned AHLMA members.

Designer Mango, whose firm designed the Tappan electronic range, the Emerson air-conditioner, and a combination built-in washer and dryer, complete with steam ironer, pictured the next step as combining the bathroom, the home laundry, and an exercising room into "the clean room".

According to this designer, in looking into the future of automatic home laundry equipment for the clean room, we should see equipment that will wash, dry and sanatize — and — fold same articles.

### Future materials considered

Projections for the future in materials such as aluminum, plastics, porcelain enamel, paints and steel were presented by John Willard of Alcoa, T. A. De Marco of Monsanto, Donald Goetchius of Ferro, Tom Armel of Glidden, and W. B. Nixon of Armco. Nixon was chairman of the Materials Imagineering session.

According to Willard the consumption of aluminum is expected to double in 1965 as compared with 1955. Consumer goods are expected to be the second largest user of aluminum.

Starting with the agitation for washers and the Westinghouse custom refrigerator cabinet, plastics are expected to broaden their market in the appliance field, according to De Marco.

"You will see further reduction in enameled thicknesses and perfection of one coat processes" said Goetchius. 1965 should see us operating in temperatures of 1000 to 1300°F. Fabrication of pre-enameled aluminum coil stock into cabinets may be possible.

Armel referred to the "revolution" in the paint business, involving entirely

Featured speaker Richard E. Krafve, of Ford Motor Co., with Roy C. Ingersoll, chairman of the board, Borg-Warner.

exclusive MPM photo

new methods, materials, and resulting finishes, including some "super enamels". Water-reducible paints and 100 per cent solids materials were highlighted. He showed a cabinet wall section product including exterior, interior, and insulating core.

Steel and plastics may be combined into a single product within the next ten years, Nixon predicted. Stainless will provide terrific tensile strengths, and the one-coat, one-fire enameling irons should be a reality in 1965, he stated.

## To produce is not enough, Ford executive warns AHLMA

Speaking before the home laundry manufacturers' annual banquet, Richard E. Krafve, general manager of Ford's new Edsel Division, warned that industry must find ways to sell what it can "so easily produce." He was introduced by Roy C. Ingersoll, Borg-Warner chairman.

"Although the continued rise in incomes has brought a marked movement away from uniformity on consumer goods," Krafve said, "industry's big job in the future lies in the field of distribution."

"Over the past decade," he continued, "manufacturing technology has improved to the point that most industries can now supply all the products their customers want to buy. With our population growth, with more and more new families being formed, and with incomes on the rise, markets for the kinds of goods people want should expand in the future."

Krafve suggested that distribution alone would not solve individual problems, adding that when mass production first began to yield large quantities of goods at low cost, the customer bought and was satisfied on the basis of utility alone.

"But as time passed, he (the customer) was no longer intrigued by a product simply because it worked. He had come to take that for granted. He wanted beauty and style, ease of operation, and distinctiveness. And he was willing to pay more for refinements.

### The president reports

At Thursday's luncheon B. J. Hank, AHLMA president, reported on the status of the industry. Hank predicted that within the next eight years the industry will make as much progress and possibly more than in the past eight years. Currently, sales are running between those for 1955 and 1956. This means that sales are running between the two highest years ever experienced. At the end of this year the industry is expected to be within five or six per cent of 1956.

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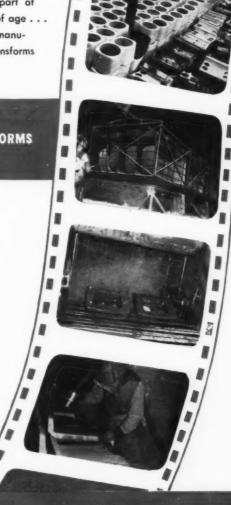
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### editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

### **26th National Packaging Exposition displays modern methods**

The 26th National Packaging Exposition, held at the International Amphitheatre, Chicago, April 8-11, unfolded before the eyes of visitors virtually hundreds of exhibits featuring minute tapes to automatic strapping machines, and various types of equipment running the gamut of industry-wide packaging. Concurrently with the exposition, which was sponsored by the American Management Association, a three-day National Packaging Conference was held in the Palmer House.

Hundreds of exhibitors displayed their equipment, consisting of machines, materials, and services for industrial and consumer packaging. Throughout the huge exhibition hall were aisles filled to overflowing with people interested in learning up-to-date methods of merchandising, packaging, and shipping their wares. All types of cushioning, crating, and strapping material were on display. Many varieties of labels, and the machinery to apply them to the finished product, were visible. Aluminum foil was much in evidence for use as a packaging and labeling medium.

Of special interest to packaging executives attending the conference at the Palmer House were the latest findings of the Forest Products Laboratory of the United States Department of Agriculture's Forest Service, described by a panel of speakers from the laboratory. To help shippers select the most economical and efficient materials for their



Partial view of visitors who thronged 26th National Packaging Exposition.

needs, the laboratory has been conducting cushioning research under the sponsorship of the U. S. Air Force and Army Corps of Engineers. Objectives have been to develop design methods and equations that would relate the fundamental factors involved in all cushioning problems, and to evaluate the energy absorption characteristics of the various materials.

Wooden pallets, crates, and wooden and corrugated boxes also came in for their share of discussion. A series of tests regarding crates were developed which simulated actual shipping, storage, and handling conditions, and the hazards encountered. The design cri-

teria developed have been incorporated into military container specifications, and will appear in a bulletin to be issued by the Forest Products Laboratory.

Among the principal industrial trends displayed at the exposition were automatic and semi-automatic machines for various packaging and packing applications, using electronic devices; film packaging, with plastic film manufacturers, in many cases, designing their own equipment to apply their products; custom-tailored shipping containers, utilizing polyethylene-lined corrugated boxes for the shipment of liquids, etc.; and foam plastics for protective cushion-

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# here's why Waste King uses International shipping containers



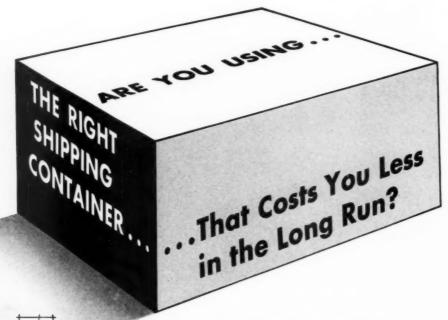
- Carton designed for fast, easy assembly. Cuts packing time 20%.
- Easy for retailer to grip and handle because of flange cap design.
- Tube and cap design also enables lift truck to stack without pallets - speedily and easily.
- Dishwasher arrives factory fresh because of dust-proof packaging.
- Large clean surfaces allow product identification and advertising.





close stacking without usual jostling.





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- I'M GETTING TOO MANY D.O.A. COMPLAINTS.
- D.O.A.'s ARE SLOWING UP DELIVERY TO MY CUSTOMERS' CUSTOMERS.
- I'M WASTING EXPENSIVE WAREHOUSE SPACE BECAUSE I CANNOT SAFELY STACK MY PRESENT CONTAINERS HIGH ENOUGH.
- ☐ HIDDEN DAMAGE IS CAUSING TOO MANY DAMAGE CLAIMS.

If you answer "yes" to any of these questions . . . consult with a Chicago Mill representative on the right container for your product that will cost you less in the long run. Chicago Mill makes the most diversified line of containers in the country. Therefore we can recommend without bias, the best container for your product.

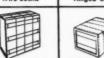


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PALLET BOXES-Hinged Corner









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### PLANTS

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- TALLULAH, LOUISIANA

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ing of valuable fragile items.

Prepackaging of agricultural food products, under research by the Department of Agriculture, was reported to have gained impetus because of reduced spoilage and waste, and the rising acceptance of the consumer for this type of package. Much work has also been done on the packaging of bulk produce.

The final attendance count at the exposition was 35,800. There were 370 companies exhibiting, occupying over 131,000 sq. ft. of floor space.

The next AMA National Packaging Show is scheduled to be held at the New York Coliseum, May 26-30, 1958.

### HEINTZ MANUFACTURING CO. REPORTS ON NST BENEFITS

The Heintz Manufacturing Co., Philadelphia, Pa., a participant in the National Safe Transit Program for a number of years, continues to enjoy the many benefits resulting from pre-shipment testing as developed by the National Safe Transit committee.

Edwin M. Butler, assistant to the executive vice president at Heintz Manufacturing, reports to the NST committee as follows:

"This fine program has contributed considerably to increasing the efficiency of our own materials handling personnel, as well as stimulating staff desire to find less costly and more effective methods of packaging materials for safe transit.

"The natural result of such procedure assures increased customer good will and brings to a minimum loss sustained from damage."

### **GENERAL BOX ANNOUNCES EXECUTIVE APPOINTMENTS**

General Box Company announced the appointment of three new vice presidents, John M. Ladd, Alan L. Irwin, and Charles C. Bush, following action by their board of directors. The announcement was made by the president of the company, J. A. Cragwall, at their executive offices in Des Plaines, Ill.

Cragwall also announced that David B. Forrester, vice president and manager of the Meridian, Miss. plant, had joined the executive sales staff at Des Plaines. He will head up the company's specialty sales. Charles E. Keene, manager of the Winchendon plant, has taken his place at Meridian, and John O. McGillivray has been promoted from the sales staff to manager of the Winchendon operation.

### 26th National Packaging CANADIAN WESTINGHOUSE BEGINS USE OF NST PROJECT 1B



Shown is the special plastic-sided car supplied by the Canadian National Railway which was used by the Canadian Westinghouse Company, Ltd., to conduct NST pre-shipment tests for basic carloading. Note the position of the shock recorders in the doorway. Note also the large speedometer which registers the speed at the time of impact.

Canadian Westinghouse Co., Ltd., Hamilton, Ontario, recently began preshipment tests for basic carloading, according to W. C. Luton, Superintendent of Appliances Quality Control. tests are set forth in the National Safe Transit committee's "Test Procedures" covering Project 1B, and were formulated by the committee's Technical Planning Division.

A special plastic-sided car supplied by the Canadian National Railway is used for the tests. Two shock recorders are placed in the doorway.

The data developed as a result of the tests proved to be very enlightening, Mr. Luton reports to the NST committee. The load tested-a mixed shipment of refrigerators, ranges, and laundromats -was selected because of the difficulty in bracing. Impact was produced into the last quarter of the fifth zone as shown on the shock recorder.

After the tests, the contents of the car were examined, and two products were found to be damaged slightly. Changes in the bracing were made immediately.

The NST committee's Project 1B is used in conjunction with Projects 1 and 1A-pre-shipment tests for individually packaged products-to reduce in-transit damages to a new low minimum.

### FACTORY-PACKAGED BOILER **CUTS HANDLING, INSTALLATION**

Whacking hours off installation time - making Bryant Manufacturing Company's Model 26 gas-fired boiler more competitive with warm air heating systems - that's what Bryant engineers have done in working out factory assembly of this residential water boiler.

Five sizes of the Model 26 - ranging from 67,500 to 157,000 BTU/hr. A.G.A. ratings - are being assembled at Bryant plants.

The crate that holds the boiler reflects the creativeness of Bryant engi-

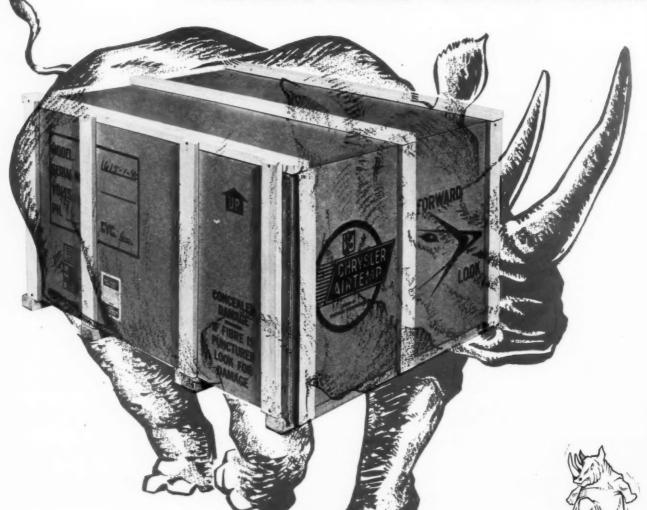
neers who designed it. Before design of the crate was finalized, the boiler itself was examined. By adding a small arm to the existing end section castings, and attaching a "U" shaped steel channel to two sides of the boiler base, Bryant engineers accomplished two things.

First, they made crate design extremely easy. The crate actually has no conventional base, but instead heavy wood 2 x 2's fit snugly into the "U" channel along both sides of the boiler's base. The front and the rear of the boiler base are also enclosed with heavy

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# Automatic conveyor system simplifies appliance in-plant handling

packaged appliances conveyed automatically from assembly plant to shipping warehouse at Westinghouse East Springfield plant

See "Fabricating room air conditioners" in this issue

THE Westinghouse electric appliance plant at East Springfield, Mass., recently installed an automatic conveyor system that gathers packaged appliances by product, stores them on an accumulator conveyor until it is full, then releases the appliances to a main trunk conveyor that moves them to the shipping warehouse. The appliances are moved from the package sealing machine at the end of the assembly line to the warehouse without any manual handling of any kind.

Storing and marshalling is the key

to the effectiveness of the system. As a result, packaged appliances are received in the shipping warehouse in standard lots, not in assorted lots. This greatly facilitates handling for storage or for shipment.

Each accumulator line is made up of two or more storage conveyors. The length of each accumulator conveyor line — there are a total of eleven in the system — has been calculated to provide storage on the primary conveyor for one-half hour production of the assembly line it serves plus a length on the secondary conveyor to absorb the production until the primary conveyor is emptied. Should all accumulator conveyor lines ever become full to the one-half hour limit simultaneously, then any given conveyor line must hold its load until the other conveyor line loads are sequentially released to the main trunk conveyor.

### Live roll conveyors used

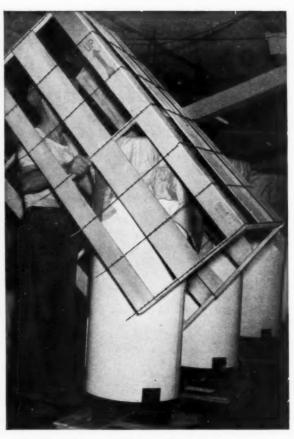
The accumulator conveyors are of the live roll type and the length for each conveyor has been calculated and

Shipping carton is slipped over Westinghouse Streamliner room air conditioner as it nears end of assembly line in the East Springfield appliance plant. Carton will be stapled to wooden base and packing added to prevent damage in transit. Carton is then closed and stapled. The belt conveyor takes the packaged unit to the shipping warehouse.





This coal circulator weighs 539 pounds. It's assembled on base of wirebound crate. Total man-hours for packing come to just 6 minutes.



Water heater bases are bolted to wirebound crate base before assembly. At this point, only 3 minutes are needed to complete crating.

# Appliance maker uses 17 General-engineered wirebounds to cut packing costs on 47 items

Gray and Dudley Co., Nashville, Tenn., obtained the figures on packing and shipping costs using wire-bounds designed by General Box Company, and compared these with the costs of making their own shipping crates. The study covered 47 different designs and sizes of electric water heaters, electric and gas ranges, oil circulators, coal circulators, cast iron ranges, army ranges, and their spare parts. Wirebounds won a clean decision.

Comparison was made on the basis of man-hours for packing, shipping weights, and over-all packing costs. In the case of a 539-pound coal circulator, for example, the saving was 80% in man-hours, 10% in shipping weight, and 16% in over-all packing cost.

The assembly and packing operations were integrated to save handling costs; noise and dust were eliminated, and the appearance of the products in transit was improved. The crated products have a Safe Transit O.K., too.

It's easy to find out how much General-engineered wirebounds can save you. Let us send a man. No obligation. Just write General Box.

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

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\* \* \* \* \*

### **Automatic conveyor system simplifies** appliance in-plant handling

-> from Page 93

limited so the pressure of the accumulator loads will not exceed 200 pounds tractive force. In some cases, one live roll conveyor does the job; in others, two are required for a line. A brake belt is provided at the end of each primary or secondary accumulator to prevent packaged appliances being pushed

onto the trunk or following conveyors. Whenever a primary accumulator conveyor in a line is loaded to the onehalf hour capacity, a full load limit switch is actuated and the conveyor is stopped. A timing device, used in conjunction with the limit switch, signals the control system that the primary conveyor is loaded. The control system responds when the sequential timer

senses the full load signal and releases the accumulator load of packaged appliances to the main trunk conveyor. Should the entire accumulator line fill up completely, a safety limit switch is actuated and shuts down the preceding motor driven conveyor. This prevents damage to the conveyor system.

### The master control system

The master control system is comprised of a series of interlocking relays together with transformers, timers, and related electrical devices. The system operates as follows:

The control system senses the accumulator lines in sequence. When primary accumulator conveyor is loaded to the one-half hour capacity, the timing device signals the control system and the brake belt is started in sequence. The belt runs long enough to discharge the packaged appliances to the main trunk conveyor. As soon as the primary accumulator is unloaded, the brake belt is stopped and the control system continues to sense the accumulator lines in sequence. Loads discharged from the brake belt converge into the main trunk conveyor and continue across the bridge into the shipping warehouse.

In the warehouse, branch conveyors carry the packaged appliances to the areas where these are normally stored. The same branch conveyors are used for moving appliances from the storage area to the shipping platform.

### Safe Transit News

-> from Page 91 wood 2 x 2's.



Because these 2 x 2's fit around the perimeter of the boiler, and because the "U" channel elevates the boiler somewhat, the boiler can be readily handled with a fork lift truck, towmotor, or even a hand truck.

Side members of the crate are stapled and wired to the heavy perimeter base and top. Attached to the top of the crate is an L-shaped steel plate, so mounted that it exactly fits into the boiler's flue connection, effectively stabilizing the boiler and eliminating in-transit "rock and roll".

Results of this crating method in test shipments by both truck and rail: not a damaged boiler in a carload.

Unlike conventional crates, the crates on Bryant's factory-assembled Model 26 boilers are not removed until the boiler is set at the exact point of installation. Then, a few heavy-duty wires are "unlocked" and the boiler is quickly in-

The only parts not installed at the factory are the draft hood, the transformer, and the pressure relief valve.

### WIREBOUND GROUP SETS RECORD

The wirebound shipping container

industry in 1956 set a new all-time record for the third successive year with a total volume of \$120,660,973, the Wirebound Box Manufacturers Association was told at its annual meeting in Chandler, Ariz., March 20-22.

L. S. Beale, secretary of the association, reported that the 1956 volume of business for the industry was 7.6 percent over 1955.

"All manufacturing, engineering and quality efforts are in vain if the product reaches its destination in a damaged condition."



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and steel enamels. Previous experience and age not important factors. Send complete resume and salary requirements, which will be held in strictest confidence, to Box 5B, Dana Chase Publications, York Street at Park Avenue, Elmhurst, Illinois.

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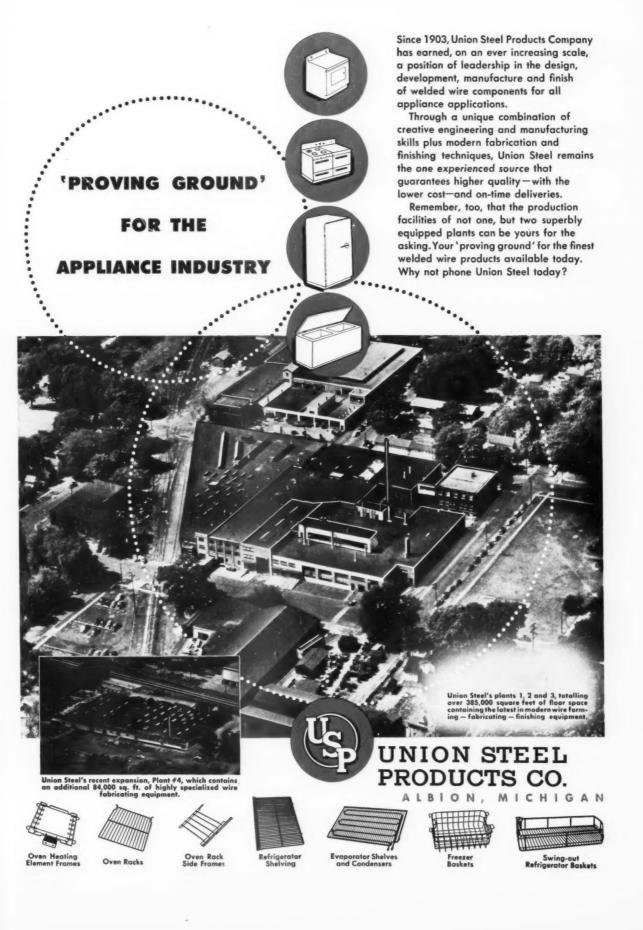
Steel furniture manufacturer located in small Wisconsin city needs a practical, experienced finishing trouble shooter who is familiar with electrostatic spraying, flow coating, dipping, metal preparation, bonderizing and degreasing. Should be capable of developing controls, improve yield from finishing materials, engineer conveyorization, prepare samples and develop new finishes. Write Personnel Manager, Hamilton Manufacturing Company, Two Rivers, Wisconsin, giving qualifications.

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SPECIFICATIONS FOR WHITE APPLIANCE FINISHES by Edward G. Bobalek, Professor of Chemical Engineering, Case Institute of Technology. Four pages — two color. Critical problems in testing discussed, procedures and pitfalls pointed out and explained in this report which is of interest to all organic finish users. 15¢ per copy.

FORMABILITY OF METALS by Lester F. Spencer, Consultant in Metallurgy. Sixteen pages—two color. Covers: basic characteristics of metals, the carbon steels, press operations and roll forming. 25¢ per copy.

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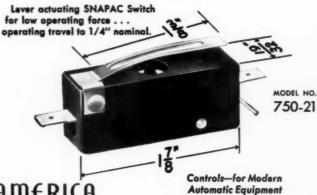
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- · Available S P S T normally open or closed, or SPDT

### Rating:

15 amp 125 V. A.C. 10 amp 250 V. A.C. 1/2 h.p. 125/250 V. A.C. Listed by Underwriter's Laboratories

SNAPAC pin plunger switch operates within 1/32" to 1/16" pre-travel.

Total 3/32" to 1/8". MODEL NO 750-11 Panel mounting SNAPAC Switch for extra over travel requirements. Pre-travel 1/32" to 1/16". Total travel 1/4" to 3/8". MODEL NO. 750-31



Write for SNAPAC Bulletin SL-3

CONTROLS COMPANY OF AMERICA



DIVISION

9559 SORENG AVENUE . SCHILLER PARK, ILLINOIS











